DAIRY INDUSTRY

HEARING

BEFORE THE

SPECIAL SUBCOMMITTEE TO INVESTIGATE THE DAIRY INDUSTRY IN THE UNITED STATES

OF THE

COMMITTEE ON AGRICULTURE HOUSE OF REPRESENTATIVES

EIGHTY-THIRD CONGRESS

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DAIRY INDUSTRY

TUESDAY, JULY 7, 1953

HOUSE OF REPRESENTATIVES,
SPECIAL DAIRY SUBCOMMITTEE OF
THE COMMITTEE ON AGRICULTURE,
Washington, D. C.

The subcommittee met at 10 a. m. in the committee room of the House Committee on Agriculture, Hon. August H. Andresen (chairman of the subcommittee) presiding.

Mr. ANDRESEN. The committee will come to order.

We are privileged this morning to have with us Prof. Roland W. Bartlett, of the University of Illinois. Dr. Bartlett, as I understand it, has done considerable research on the subject of dairying, and when he volunteered to appear before our committee I knew that the members of the committee would like very much to hear him.

Dr. Bartlett, we would be very glad to have you proceed in your own manner and to give us the benefit of your research work.

STATEMENT OF ROLAND W. BARTLETT, PROFESSOR OF AGRICULTURAL ECONOMICS, COLLEGE OF AGRICULTURE, UNIVERSITY OF ILLINOIS, URBANA, ILL.

Mr. BARTLETT. Thank you, Mr. Andresen. I have some material to which I am going to refer from time to time. If you want to take these at this time you may have them.

Mr. ANDRESEN. All right.

Mr. BARTLETT. I have set down, Mr. Andresen, a series of points which I plan to cover this morning. I appreciate the fact that you are busy men, so I tried to put this material in as brief a form as I can.

There will be some material to be presented as exhibits because I do want to take the time to go over it, but I will just call attention to those as we go along and refer to them when we come to that material.

As the first exhibit is this paper on New Techniques and Products which I presented before the Eighth Annual Midwestern Milk Marketing Conference at Iowa State College on April 1, 1953. I think that is included in each one of the material which I turned over to committee members.

I am going to read a little from this, but I am not going to read all of it. I will call attention to specific things.

(The information is as follows:)

EXHIBIT I

Agricultural Economics 334

NEW TECHNIQUES AND PRODUCTS [1]

Roland W. Bartlett [2]

During World War II farmers, urban industry, and labor put aside their personal differences to fight a common enemy. Dairymen in the United States now have a common enemy—vegetable fat substitutes. Confronted with this fact, I am convinced that they can and will take such action as is necessary to maintain and expand the market for dairy products.

An appraisal indicates that per capita sales of butter,[3] ice cream, and evaporated milk are likely to decrease while per capita sales of market milk, cheese, and dried whole milk will increase (tables 1 and 2). With these changes we shall also have a probable increase in population from 152 million in 1950 to 169,400,000 in 1960, a net increase of 11.4 percent. The combined effect of changes in population and per capita sales is likely to result in an increase of around 9 percent in total milk needed in 1960 compared with the amount used in 1950.

Can market milk sales be increased 20 percent by 1960? In a recently published article,[4] I predicted that per capita sales of market milk and cream would be 20 percent higher in 1960 than in 1950. This estimate is predicated upon six assumptions:

1. That efficient distribution practices now in use on a limited scale will be adopted generally, with the result that the prices to consumers on a nationwide basis will be reduced as much as 2 or 3 cents a quart.

2. That competitive class I (market milk) prices will be restored in specific areas of the country that now exact prices above their competitive level.

3. That a battery of vending machines, some dispensing half-pints or third-quarts, and others dispensing quarts or 2 quarts of milk, will be distributed in strategic locations throughout the country to make milk more available.

4. That vendors who own their own trucks and buy bottled milk at the platform will gradually replace union drivers in all areas where wage rates exacted are materially above their competitive level.

5. That fresh concentrated milk from surplus producing areas will be sold in all areas of the country where present consumer prices for whole milk are materially above the Nation's average.

6. That research studies discussed later will show other ways of broadening the market for milk and its products.

TABLE 1.—*Comparison of utilization of milk in the United States in 1950 with estimated utilization in 1960* [1]

[Million pounds]

Utilization	1950 [2]	Estimates for 1960 [3]	Percent change
Fluid milk and cream	58,450	78,263	+34
Butter	33,345	20,805	−38
Cheese	11,680	16,940	+45
Evaporated and condensed milk	6,940	5,801	−16
Ice cream	6,270	4,367	−30
Dried whole milk	1,560	3,388	+117
Other uses	5,136	5,136	0
Total	123,381	134,700	+9.2

[1] Included in paper presented at Dairy Store Conference, General Extension and Food Technology University of Illinois, Dec. 10, 1952.
[2] U. S. Department of Agriculture Agricultural Statistics, 1951, p. 400.
[3] Estimates of R. W. Bartlett.

[1] Paper presented at Eighth Annual Midwestern Milk Marketing Conference, Iowa State College, April 1, 1953.
[2] Professor of agricultural economics, University of Illinois College of Agriculture.
[3] See Illinois Farm Economics, February–March 1953, pp. 1437–1442.
[4] Prairie Farmer, December 20, 1952. Also included in talk of December 10, 1952, before Dairy Store Conference at University of Illinois.

TABLE 2.—*Civilian per capita consumption of specified dairy products and margarine, United States, average 1935–39, annual 1945–52* [1] [2]

Average	Total milk	Fluid milk and cream	Butter	Cheese	Evaporated and condensed milk	Ice cream	Dried whole milk	Margarine
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*
1935–39	801	340	16.7	5.5	16.6	9.5	0.12	2.9
1945	804	432	10.6	6.6	18.2	13.1	.37	4.0
1946	8 3	423	10.5	6.7	18.5	22.5	.51	3.8
1947	787	398	11.1	6.9	20.3	19.4	.45	5.0
1948	751	387	9.9	6.9	20.1	17 3	.29	6.1
1949	761	384	10.4	7 2	19.6	16.4	.25	5.7
1950	776	385	10.7	7.7	20.0	16.1	.28	6.1
1951	759	395	9 6	7.2	18.2	16.1	.27	6.5
1952	743	400	8.7	7.5	17.9	16.2	.34	7.7
1960 [3]	795	462	6.0	10.0	15.0	10.0	.56	

[1] Data from USDA Bureau of Agricultural Economics. Data for 1951 were preliminary and those for 1952 were partly forecast.
[2] Included in paper presented at Dairy Store Conference, General Extension and Food Technology, University of Illinois, Dec. 10, 1952.
[3] Estimates by R. W. Bartlett.

"Sacred cows," whether those of distributors, farmers, labor, or government, will be sacrificed in bringing about these changes. I believe that the machinery is already in motion to effect such changes and that they are definitely in line both with the public interest and with the long-run interest of the dairy industry.

Will stores become increasingly important in lowering milk-distribution costs, retail prices, and aiding in increasing per capital sales of milk? In 1952, it was estimated that stores handled 45 percent of the milk sold to consumers in the United States, while home deliveries constituted 55 percent of the total.[5] The highest proportions of store sales are to be found in the larger cities, such as New York, Chicago, Los Angeles, and San Francisco, each of which distributes over two-thirds of its milk through stores. In fact, in my opinion, over three-fourths of the cities and villages in the United States still have either a 1-cent store differential or exact as much for store milk as for home deliveries. Hence, it seems to me that the greatest opportunity for lowering distribution costs, lowering retail prices, and increasing per capita sales of milk, is to initiate mass distribution of milk with a store differential ranging from 2 to 6 cents a quart in all the markets that now have a 1-cent or no differential, as well as to keep cutting away at the gross distribution margins of markets where store sales are already large.

The gallon jug: At the present time the gallon jug is the most important force in lowering handling margins and milk prices to consumers. In Akron, Ohio, over 40 percent of total sales are made by one dealer through stores operated under his management. In March 1953, milk was sold to consumers in these stores at 62 cents a gallon, or 15½ cents a quart. This is the lowest price reported for Grade A milk in any large market in the United States. In the summer of 1952, the price in gallons was 13½ cents a quart. Unfortunately per capita sales are not available for this market. It is hoped that studies now underway will make this fact available.

In the Chicago market, the gallon jug has become increasingly important, particularly since 1950. In April 1946, 11.6 percent of the milk in the market was sold in gallon jugs.[6] By April 1952, this proportion had increased to 21.9 percent, and it is probable that it will be around 24 percent by April 1953. Why this large increase in the use of the gallon jug, which is heavy and breakable, requires a deposit, and is irritating to those handling it?

The answer is simple: Price. In March 1953, the reported retail price of a single quart of home-delivered milk in Chicago was 24.5 cents, or 6¼ cents a quart more than the price per quart of milk purchased in chain stores in gallon jugs (73 cents a gallon, or 18¼ cents a quart).[7] In some areas the gallon jug sells for 65 cents, or 16¼ cents a quart. Most people are hard up today and are looking for ways to get more for less money. This situation is as true for the people in cities with no store differential as for those in Chicago.

[5] Included in talk presented by George Scott, vice president of Excello Corp., at the University of Illinois, February 3, 1953.
[6] Based on audited reports of the Chicago Federal Milk Market Administration.
[7] Data from USDA Fluid Milk Report for March 1953.

Half-gallon container: The half-gallon paper container was introduced in the Chicago market in the summer of 1949. Prior to this time (1948), half-gallons in glass constituted 21 percent of total sales.[6] By April 1952, they had increased to 35.9 percent. In April 1952, gallons and half-gallons constituted about three-fifths of the total sales of milk in Chicago. Increased use of half-gallons in paper resulted from both price and convenience. In March 1953, the price of a half gallon of milk in paper at chain stores in Chicago was 20½ cents a quart, or 4 cents a quart less than the reported price of a single quart of home-delivered milk.

FACTS ABOUT PER CAPITA SALES OF MILK IN THE CHICAGO MARKET

1. Per capita sales of milk have increased more rapidly since 1935–39 in Chicago than in the United States as a whole. Per capita milk sales in Chicago were 40 percent higher in 1952 than in the prewar period. This compared with a 34-percent increase for the United States (table 3).

2. Per capita milk sales in Chicago were 2.7 percent higher in February 1953 than in 1952 and 43 percent above the prewar average.

3. Relatively higher increases in Chicago milk sales did not result from greater increases in disposable income. This fact was shown for 1935 to 1950 in the July 1951 issue of Illinois Farm Economics. In 1952, per capita disposable income in the United States was 193 percent above prewar. This was slightly greater than the increase in Chicago (173 percent).

4. With facts now available, it is impossible to determine the influence of each factor causing higher milk sales in Chicago. Some of the probable reasons for higher sales are:

(*a*) Increase in store sales: Store sales increased from 6 percent of total sales to consumers in 1930 to around 70 percent in 1952.

(*b*) Increased use of quantity discounts (discussed above).

(*c*) The relatively low price of milk compared with prices of other foods: In 1929 milk at both homes and stores in Chicago was sold to consumers for 14 cents a quart. In March 1953 milk in gallon jugs sold for 18¼ cents, or only 30 percent above the 1929 price. The half-gallon price in March 1953 averaged 46 percent above the 1929 price. Prices for all foods in Chicago in December 1952 (latest data available) averaged over 80 percent above those for 1929.

Intermarket shipments of milk increase per capita sales: Until recently milk sold in most Illinois markets was produced within a milkshed adjacent to each market. Now, however, milk may be shipped from a centrally located bottling plant to markets as far away as 200 miles. In fact, in May 1952 over 500,000 quarts of milk bottled in paper containers in milk plants located in Illinois were sold daily to markets outside the place where the bottling plant was located.[8]

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[8] A study of out-of-market shipments of milk in paper containers is being made for each of the 13 States in the north central region.

TABLE 3.—*Population, average daily sales of whole fluid milk, per capita consumption, and annual average income per person, Chicago metropolitan area,[1] 1934–52*

Year	Estimated population [2]	Average daily sales of whole fluid milk [3]	Per capita consumption daily	Index of per capita consumption daily (1935–39 =100)		Average annual per capita income [4] after taxes
				Chicago	United States	
	Thousands	*Thousand pints*	*Pints*			
1934	3,551.0	1,917.0	0.540	97	95	(5)
1935	3,554.0	1,936.8	.545	98	91	$765
1936	3,557.0	1,959.7	.551	99	98	703
1937	3,559.0	1,979.0	.556	100	102	724
1938	3,562.0	2,001.9	.562	101	100	671
1939	3,565.0	2,019.5	566	102	102	713
1940	3,567.6	2,141.6	.600	108	102	803
1941	3,592.0	2,153.8	.600	108	105	970
1942	3,616.5	2,297.8	.635	114	115	1,119
1943	3,640.9	2,553.5	.701	126	134	1,350
1944	3,665.3	2,675.8	.730	131	139	1,455
1945 [1]	4,959.4	2,674.1	.741	132	143	1,283
1946	5,020.0	3,866.7	.770	138	133	1,431
1947	5,080.5	3,875.1	.763	137	130	1,781
1948	5,141.0	3,892.8	.757	136	130	1,801
1949	5,201.5	3,988.7	.767	138	128	1,867
1950	5,262.1	4,035.5	.767	138	129	1,780
1951	5,322.6	4,114.8	.773	139	133	1,932
1952	5,383.1	4,181.0	.777	140	134	1,956

[1] 1939–44 years include only Order 41 area. 1945 and subsequent years include both O–41 and O–69 areas.
[2] 1934–39 taken from R. W. Bartlett's The Milk Industry, p. 189. Subsequent data compiled from census reports for 1940 and 1950. Intercensal years computed on straight-line interpolation. Population of Cook, DuPage, and Will Counties under Order 69 was reduced by an amount equal to number of persons living on farms on which cows are milked as reported in 1945 Census of Agriculture on a county basis.
[3] Data from Chicago Market Administrator, Order 41, Reporter and Order 59, Market News. Data for 1934–39 taken from The Milk Industry, footnote 2. Out-of-market sales including both bulk and packaged milk have been excluded.
[4] Data for 1934 not reported on city basis. Data for 1952 not available. Figures are those reported in Sales Management, Survey of Buying Power, issue of May 10 (formerly Apr. 10) for Chicago divided by Sales Management population figures.
[5] Not available.

Source: Prepared in the department of agricultural economics, University of Illinois, College of Agriculture, Urbana.

Out-of-market milk shipments in Illinois were accompanied by a 2-cent reduction in the store price of milk and were an important factor in increasing per capita sales. From 1945 to 1949 per capita sales in 8 Illinois markets increased 15 percent at the same time that those for the United States decreased 10 percent.[9] Extension of a substantial store differential into the many markets where store and home-delivered prices are the same is likely to be accompanied with similar increases in per capita sales of milk.

Will vendors who own their own trucks displace union milk drivers? The answer to this question will depend, at least in part, on the policy of labor unions. In areas where the union wage scale is in line withe the prevailing wage for labor in this type of work, there will be less incentive to have vendors than in areas where the union rate is materially above that for similar types of labor. In the latter case it may be expected that more and more milk will be sold to vendors at the platform of bottling plants with an accompanying reduction in the number of union employees of dairy companies.

In a southern market one dealer handling over 60,000 quarts daily now operates a milk plant exclusively for vendors. Part of these vendors distribute milk to homes, while others serve wholesale stops.

In another market, union employees hauling milk from a bottling plant to stores were recently entirely displaced by vendors. Picketing of the plant was immediately prohibited by a court order that was later upheld by the court of appeals and by the supreme court of this State. The case is now before the United States Supreme Court.

[9] The Changing Pattern of Milk Distribution, Illinois Farm Economics, April 1952, pp. 1340–1347.

What about the future of fresh concentrated milk? This question can be answered more convincingly 5 years from now than at present. Several facts, however, may well be reviewed:

1. Dr. Iverson's experiment on once-a-week home deliveries of fresh concentrated milk to some 500 Iowa farmers over an 18-month period has proved successful. Applied to large commercial markets in place of every-other-day deliveries, the result might be a saving of up to 4 cents a quart over and above increased costs of concentration. For example, in Champaign-Urbana, the present costs of home delivery is around 8 cents a quart. If a family purchased 9 quarts a week on an every-other-day basis, the total cost would be 72 cents. If 3 quarts of fresh concentrated were delivered on a once-a-week basis at the same rate, the cost would be 24 cents. The saving in delivery cost would be 72 cents minus 24 cents, or 48 cents.

Dr. Iverson estimates the cost of concentrating milk on a 3-to-1 basis to be around 1 cent a quart. At 1 cent, concentration costs for 9 quarts would be 9 cents. Thus the potential saving in distribution costs on 9 quarts of milk—48 cents minus 9 cents, or 39 cents—would be 4⅓ cents a quart.

2. Fifteen percent of all milk sales of a large chain of stores in California are fresh concentrated milk. This milk is sold at 3 cents a reconstituted quart below the store price of regular milk.

3. Earlier studies have indicated that potential savings ranging from 3 to 6 cents a quart would be possible by selling fresh concentrated milk originating in surplus producing areas to deficit areas.[10] Part of such savings would accrue from lower transportation costs and part from improved methods of distribution.

4. The United States Navy has been using fresh concentrated milk for over 2 years and is expanding its purchases of this product. With these facts in mind, it will be well for the dairy industry to watch carefully the developments in the sale of fresh concentrated milk during the next few years.

What research studies should be initiated to broaden outlets for milk and its products? In my opinion, the immediate needs of the dairy industry are not for more fundamental research, though this should be continued. Rather, the needs of the industry today are:

1. To study the merchandising methods and techniques that have proved or are likely to prove most effective in increasing sales of dairy products.

2. To assemble them in ways that are easily available and that can readily be used by all those interested in maintaining and expanding outlets for dairy products.

In a balanced program of research, in my opinion, at least four-fifths of the research funds should be spent on these two phases. Civilian sales of nonfat solids are now more than double those of 1940. This increase has been brought about through scientific application of good merchandising methods. The American Dry Milk Institute works with bakeries, meat packers, dairies, confectioneries, soap manufacturers, and many others in promoting the sale of nonfat solids. They work with the people who make the policies of these organizations, and the large increase in sales is solid evidence of their success.

Each segment of the dairy industry, but particularly market milk, needs to do what has been done with nonfat solids. Obviously it is impossible in this brief period to cover the whole waterfront of possibilities in this field. But some studies that might well be made are outlined below.

School-lunch programs: In October 1951 there were 29,846,000 students enrolled in American public schools.[11] If, during school hours, each student drank one-half pint daily for 180 days, this would use 45 quarts of milk per student, or a total of 2,888 million pounds of milk annually. Actually in the school year of 1951–52, consumption per student was only 12 quarts,[12] or only about one-fourth of the above estimate. Why? Bad quality? Warm milk? Too high price? Lack of electric refrigeration? Lack of vending machines? Lack of Norris dispensers? Competition with candies and sweet beverages? These and other factors might well be studied.

At its 88th annual meeting in May 1952, the executive council of the Illinois State Dental Association unanimously adopted the following resolution:[13]

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[10] Illinois Farm Economics, October 1951, pp. 1236–1245.

[11] Published in Current Population Reports, Population Characteristic Series, p. 20, No. 40, July 1952.

[12] Computed from information received in a letter dated March 9, 1953, from Samuel C. Vanneman, Chief, Civilian Food Supply Division, USDA.

[13] Illinois Dental Journal, vol. 21, No. 8, August 1952.

"Whereas leading dental research workers and scientists have practically universally reached the definite conclusion that the intake into the amount of refined sugars and foods made therefrom are the primary contributing cause of dental caries; and

"Whereas despite the great increase in dental health education and more universal dental care of our children, the caries rate steadily increases; and

"Whereas since we members of the dental profession should be, and are, the most interested group concerned in the control of dental caries and the improvement of dental health; and

"Whereas since in many, if not most, of our primary schools the pupils are allowed to purchase sugar-containing confections and beverages without any restrictions and with the applied approval of your school systems and school authorities: Therefore be it

"*Resolved*, That the Illinois State Dental Society go on record as condemning the sale of candies, gums, and sweetened beverages in all primary schools in the State of Illinois and favoring substituting therefor such sugar-free foods as nuts, potato chips, and milk."

How well is our dairy industry using endorsements such as these in promoting milk sales in schools?

Potential outlets to nonagricultural workers: Various studies have shown that productivity is increased when one drinks a glass or more of milk in the midmorning and in the midafternoon. With this fact in mind, one may well raise the question: What has been done in an organized way to tap the potential market of 46,608,000 workers now employed in the nonagricultural industries? If these employees consumed an average of one-half pint a day for 250 working days, this would create an outlet for over 6 billion pounds of milk, which is equivalent to around 300 million pounds of butter and about 564 million pounds of nonfat solids.

Present consumption of milk by these workers is only a fractional part of the potential. When milk is available, some factory workers doing heavy work are not satisfied with one-half pint; they want a pint or more. Factory locations have been found to be a favorable location for vending machines. In one study [14] four-fifths of all machines were located in factories. In some factories milk is served by drivers at specific locations during the 15-minute rest period. A thorough study of the techniques which have proved most practical in serving industrial employees could be used as the basis for a very large expansion of milk sales to this group of people.

Soda fountains and lunch counters: Figures show that in 1948, there were 102,657 soda fountains and lunch counters in the United States.[15] What organized effort has been made to increase sales of milk and its products in these markets? Will the use of Norris dispensers help to increase milk sales through these outlets? What are the facts? Are dairy groups really doing a job of selling milk in these places? What about convenience? Availability?

Restaurants and cafeterias: What research information do we have about restaurants and cafeterias as outlets for dairy products? In 1949 there were 130,192 of these eating places in the United States.

Sale of milk through stores: Mr. Bush has told us that Safeway Stores average 400 quarts daily per store. How much do we know about milk as a builder of customer traffic: fast turnover, paper containers, gallon jugs, and store differentials? [16] How much do large store sales of milk increase per capital sales?

Dairy stores: What factors lead to the successful operation of different types of stores: location, drive-in, cleanliness, display of products, pricing, special attractions? Analyzing the results of such studies would make it possible to develop complete plans and make them available to all interested groups.

Store sales of cheese: Per capita sales of cheese have increased rapidly in recent years. Which places have the highest sales? Can their success be attributed to types of displays, packaging, advertising, or meal-planning suggestions? With such information we could develop promotional and advertising layouts and make them easily available for both store and home use.

Cottage cheese, chocolate dirink, and other bulk byproducts: What are the differences in per capita sales of different products in different places? What

[14] Illinois Farm Economics, November–December 1951, pp. 1249–1255.
[15] Statistical Abstract of the United States, 1951, pp. 882–889.
[16] See Merchandising Milk Through Stores, E. J. Lunding, Department of Agricultural Economics, University of Illinois. Mimeographic report, February 3, 1953.

factors cause these differences: quality, type, price, promotion and, advertising? With these facts, it would be possible to mave available layouts for use by all who are interested.

Lower unit distribution costs: What are the costs of farm tanks, tank trucks, farm to plant transportation, large volume per plant,[17] large volume of bottle milk per truck, and large volume per store? What causes efficiency? We need to get specific plans as to how each efficient operation can be duplicated and make these plans easily available.

Keep dairy products competitive: What are the actual differences in costs of vegetable fat and butterfat, and how can we make sure that the price differences between these products are not exaggerated? Developing ways to publicize the facts may prevent dairy products, such as butter, from being pushed into the background.

Develop new products to meet competition of vegetable fats: Such products may include low-fat-test ice cream, a butter spread with more nonfat solids, and milkshakes. This field is one in which there is plenty of room for imagination.

Mr. ANDRESEN. You may proceed as you desire, Professor Bartlett.

Mr. BARTLETT. All right. I think I will read the first page of this, since it summarizes some of the thinking I have been doing with regard to the problem of expanding markets for milk. Then I will refer to one or two other sections a little later.

As I understand it, Mr. Andresen, questions are in order at any time; is that right? I am free and open to questions.

Mr. ANDRESEN. Whichever way you prefer.

Mr. BARTLETT. While we are discussing something I would prefer, if somebody has a question, that he raise it.

Mr. ANDRESEN. All right.

Mr. BARTLETT. During World War II farmers, urban industry, and labor put aside their personal differences to fight a common enemy. Dairymen in the United States now have a common enemy—vegetable fat substitutes. Confronted with this fact, I am convinced that they can and will take such action as is necessary to maintain and expand the market for dairy products.

An appraisal indicates that per capita sales of butter, ice cream, and evaporated milk are likely to decrease while per capita sales of market milk, cheese, and dried whole milk will increase. With these changes we shall also have a probable increase in population from 152 million in 1950 to 169.4 million in 1960, a net increase of 11.4 percent. The combined effect of changes in population and per capita sales is likely to result in an increase of around 9 percent in total milk needed in 1960, compared with the amount used in 1950.

Can market milk sales be increased 20 percent by 1960? In a recently published article, I predicted that per capita sales of market milk and cream would be 20 percent higher in 1960 than in 1950.

I might just put in a word here to say that I do not claim any occult powers of devining what the sales will be in 1960. Any one of a hundred people could make a guess as good or better than mine; but it seemed to me it was desirable to go ahead and see where the per capita sales of particular products would likely be in 1960 as a guide to our total production policies. Many farmers have been jittery. They think that the bottom is falling out of the dairy industry. That is something with which I do not agree.

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[17] Illinois Agricultural Experiment Station Bulletin 560, 1952.

I have set down these estimates of per capita sales of each product and multiplied these estimates by the population in arriving at this potential market for 1960.

Mr. ANDRESEN. The bottom has fallen out of butter sales.

Mr. BARTLETT. That is right. I have included that in my estimate.

Going back to the paper: This estimate of a 20-percent increase in sales of market milk is predicated upon six assumptions:

1. That efficient distribution practices now in use on a limited scale will be adopted generally, with the result that the prices to consumers on a nationwide basis will be reduced as much as 2 or 3 cents a quart.

Mr. ANDRESEN. Will you pause there?

Mr. BARTLETT. Yes.

Mr. ANDRESEN. During the past 7 or 8 months we have had unusual milk production.

Mr. BARTLETT. Right.

Mr. ANDRESEN. Which is probably due to the mild winter and plenty of feed. Then during the spring and the following season we have had good grass, and also abundant feed supplies.

Mr. BARTLETT. That is right.

Mr. ANDRESEN. We find that the average price of milk at retail all over the country has been approximately 23 cents a quart, according to the Department of Agriculture.

Mr. BARTLETT. That is right.

Mr. ANDRESEN. Recently in many areas the price to retailers has been increased.

Mr. BARTLETT. That is right.

Mr. ANDRESEN. And also the price to the producer. We are still in the edge of the flush season of production.

Mr. BARTLETT. That is right.

Mr. ANDRESEN. I know that as far as I am concerned here I am paying 1 cent a quart more for milk today than I did 3 or 4 weeks ago.

Mr. BARTLETT. That is true. Of course I am looking at this, Mr. Andresen, primarily from the viewpoint of 1960 and some of the things that are going to happen between now and then and are happening in certain places. I will get to that with regard to Chicago in just a moment, with your permission.

Following your line of reason with regard to production, another important factor, is seems to me, is the shift from beef production to dairy production which has occurred all over the United States in the past few months. Many less cows were culled during this recent period. Fewer veal valves are kept because of the lower prices on meat.

Earlier you were talking about Kendall County, Ill. Kane County, Ill., is a good example of that shift. Historically they have been producing beef and milk. With the high prices of beef in the past 4 or 5 years most farmers went to beef. Many of these farmers lost their shirts with the low beef prices and are shifting back to dairying as fast as they can.

That is one of the factors, along with favorable weather conditions and so forth, which have caused this big increase in production in the past few months.

Mr. ANDRESEN. From 1945 and up to the spring of 1952 we lost approximately 4 million milk cows in this country.

Mr. BARTLETT. That is right.

Mr. ANDRESEN. We know the trend now is the other way.

Mr. BARTLETT. True.

Mr. ANDRESEN. They are keeping their heifer calves and probably not culling out the cows.

Mr. BARTLETT. That is right. Of course, we were getting also higher production per cow during that period, which pretty nearly offset the decreased number. Now we are getting more cows. The number is growing now.

Mr. LOVRE. Will the gentleman yield to me?

Mr. ANDRESEN. Yes.

Mr. LOVRE. Did I understand the chairman to say correctly that the price to the producer has also increased in late months?

Mr. ANDRESEN. Not out in our section; but it has in this area. It increased about a half cent a quart, I think, on the wholesale to the retailer, and the consumer pays 1 cent a quart more.

Mr. GOLDEN. Will the gentleman yield?

Mr. ANDRESEN. Yes.

Mr. GOLDEN. I think that is largely because of the increased cost of labor connected with the distributing.

Mr. ANDRESEN. That is what I was leading up to. In your analysis do you consider the additional cost of distribution?

Mr. BARTLETT. I am going to include both the cost of distribution and the farm prices in my analysis.

Mr. ANDRESEN. We are particularly interested in the cost of distribution of milk in the Chicago area.

Mr. BARTLETT. I just got an article out on this last month.

Mr. ANDRESEN. All right.

Mr. BARTLETT. That is the next thing I am going to submit.

Mr. LOVRE. I would like to ask the witness right there if the price to the producer in the country as a whole has increased during the past 6 months.

Mr. BARTLETT. Let us break that down into periods. In most parts of the United States the price to the producer from December to June was lower than the preceding year. Practically all over the country the increased volume of milk that went into manufacturing uses in the United States resulted in a blend price to producers that was lower and forced manufacturing prices to a lower level. We are now going through the normal seasonal adjustment. What Mr. Andresen is referring to is the seasonal price increase as July comes along with its hot weather. Frequently in many markets where we have had a lower price in May and June, the price automatically increases in July. So this increase in price presumably, which has occurred here, results from an automatic increase in price in July as compared with May and June.

Mr. ANDRESEN. Let me add to that, Professor Bartlett, that in areas where they produce enough market milk for manufacturing purposes the price is down around 50 cents a hundredweight to producers for the month of June.

Mr. BARTLETT. That is right, if compared with June 1952. Also, you will find that blend prices to market milk producers in most markets were down more than 50 cents in many markets as compared with June of a year ago.

Mr. ANDRESEN. I know in my area, which is and has been a dairy area, last month they received $3 a hundredweight for 3.5 milk. So in answer to your question, out in the Midwest where they produce largely for manufacturing purposes the price is down about 50 cents a hundredweight over what it was last year during the same period.

Mr. BARTLETT. In Chicago, the class I price fell 2.7 cents a quart from November to June. That is nearly 3 cents a quart. That price decrease was passed on to the consumer in Chicago. That is an important point and is not true for most markets in the United States which are monopolistically controlled.

I would like to finish these other five points before I get to that.

Mr. ANDRESEN. Yes.

Mr. BARTLETT. Going back to exhibit I, New Techniques and Products, the estimate of a 20-percent increase in per capita sales of milk by 1960, is predicated upon six assumptions. The No. 2 assumption is: That competitive class I—market milk—prices will be restored in specific areas of the country that now exact prices above their competitive level.

3. That a battery of vending machines, some dispensing half-pints or third-quarts, and others dispensing quarts or 2 quarts of milk will be distributed in strategic locations throughout the country to make milk more available.

4. That vendors who own their own trucks and buy bottled milk at the platform will gradually replace union drivers in all areas where wage rates exacted are materially above their competitive level.

5. That fresh concentrated milk from surplus producing areas will be sold in all areas of the country where present consumer prices for whole milk are materially above the Nation's average.

6. That research studies discussed later will show other ways of broadening the market for milk and its products.

"Sacred cows," whether those of distributors, farmers, labor, or government, will be sacrificed in bringing about these changes. I believe that the machinery is already in motion to effect such changes and that they are definitely in line both with the public interest and with the long-run interest of the dairy industry.

I put this down as a package. Now I want to take these one at a time to cover each of these points.

Mr. ANDRESEN. Let me ask you a question on No. 5.

Mr. BARTLETT. All right.

Mr. ANDRESEN. You state there:

> That fresh concentrated milk from surplus producing areas will be sold in all areas of the country.

Do you mean by that that there will be a free flow of milk in all parts of the country notwithstanding the milk market sheds and milk marketing agreements?

Mr. BARTLETT. Yes. I think those trade barriers will be broken down by 1960, though eternal vigilance will be necessary to keep them broken. I have some suggestions specifically on that point a little bit later.

Mr. ANDRESEN. All right. You may proceed.

Mr. BARTLETT. Another way for expanding milk sales is through the use of fresh concentrated milk. In connection with this, I would like to refer to pages 5 and 6 of exhibit I, and to Illinois Farm Eco-

nomics of October 1951, pages 1236 to 1245, as exhibit Ia, on Dr. Iverson's talk at the University of Illinois on February 3, 1953, on once-a-week home deliveries of fresh concentrated milk as exhibit Ib.

(The information is as follows:)

EXHIBIT I–A

[Illinois Farm Economics, October 1951, No. 197]

MARKETING ILLINOIS CONCENTRATED MILK IN FLORIDA

During the past year, three new products, sterilized whole milk, concentrated milk, and frozen concentrated milk, have appeared on the market. These products reflect the ingenuity and resourcefulness of research workers in an attempt to broaden market outlets for milk.

Sterilized whole milk can be produced where milk prices are low, canned, shipped, and placed in warehouses or held on store shelves without refrigeration. Homogenized under vacuum and sterilized at 285° F. for only 8 seconds, the milk retains its true flavor for a long time. Some of it has been found sweet after 9 months in the can.[1] Because it keeps well and does not require refrigeration, sterilized milk has a definite advantage over fresh or concentrated milk. Already this product is being made on the west coast and shipped to Alaska and Japan. Its general marketability, however, is limited at present by the extra costs of processing and packaging, plus high transportation costs.[2]

Frozen concentrated milk can be produced where prices are low, transported in refrigerated trucks or cars, held in cold storage, and sold to consumers in the same way as frozen fruits and vegetables. Presumably, if processed in sufficient volume to permit low unit costs, this product may be used in deep-freeze units and ocean-going vessels, and sold to some foreign countries. Again, its general marketability is limited under present conditions. The ordinary home refrigerator can store only a limited number of items at below-freezing temperatures. Any large supply of frozen concentrate would tend to crowd out the meat and other frozen products commonly kept in the freezing unit of a home refrigerator. Only a very small proportion of families as yet have a deep-freeze unit.

During the past few months concentrated milk[3] has been emerging from the experimental to the commercial stage. It has attained two main outlets: (1) Supplementing sales of regular milk and light cream as in the Boston market, and (2) replacing high-cost milk as in the Key West Navy base in Florida. The extent to which these established outlets will expand is still problematical. Further expansion in sales of concentrated milk produced in the lost-cost areas of the Midwest appears very possible if consumers in general accept the product as they have in Boston and in Key West and if regular commercial outlets can distribute it economically. Acceptance of concentrated milk as a commercial product will hasten the trend toward wider areas of distribution from a central plant through stores sales or possibly through weekly home deliveries. The trend toward store distribution already evidenced in Illinois and in other marketing areas has been one factor increasing per capita sales of milk.[4] The sale of concentrate may increase them further.

Sales of concentrated milk in the Boston market: Following an intensive advertising campaign in March and April 1951, sales of concentrated milk in the Boston market increased to about 200,000 quarts, or 2 percent of the total milk sales.[5] Since that time sales of this product have decrease to about 1 percent.[6] Boston consumers can buy (August 1951) 1 quart of concentrate,

[1] Reader's Digest, September 1951, p. 72.

[2] An executive of a dairy supply company reported (August 1951) that the price of 3 quarts of sterilized whole milk packaged in a No. 10 can at retail stores in Alaska was $1.85 or 61⅔ cents per quart.

[3] Two papers were presented on concentrated milk at the Dairy Marketing Conference held at the University of Illinois, February 7, 1951. Copies of these papers were published in mimeographed form and may be obtained upon request. A definition of concentrated milk included in these papers was: "Concentrated milk is whole fresh milk from which most of the water has been removed. When mixed with two parts of cold water, it becomes equal to fresh, pasteurized milk with all the nutritional elements. A few companies are concentrating the product on a four-to-one basis, while at least one company has a two-to-one concentration." Also in Illinois Farm Economics, March–April 1951, pp. 1133–37.

[4] Illinois Farm Economics, October–November 1950, pp. 1073–1084.

[5] Wall Street Journal, May 17, 1951.

[6] From statement of an executive of a milk producers association in the Boston milkshed, July 1951.

the equivalent of 3 quarts of regular, for 61 cents. As 22½ cents is the usual price per quart for regular milk, the customer saves over 2 cents on a quart.

Boston people have also been using concentrated milk as a substitute for coffee and cereal cream by mixing equal parts of concentrate and water.

Concerning its keeping qualities, an executive of a dairy chain in the Boston market stated: "During the past 2 months our stores located on highways leading to summer resorts have shown quite an increase in concentrate business. Due mostly to its keeping qualities, it is a natural for summer camps, resorts, or for any boat that is out on the water for a few days." [7]

Sale of Illinois concentrated milk in Key West: Between February and June of 1951 the United States Navy purchased several small lots of concentrated milk to determine its usefulness and economy. When officials recognized that the product was highly acceptable and potentially economical, they contracted with company X located in the Illinois part of the Chicago milkshed to send a truckload of approximately 8,000 quarts of concentrated grade A milk each week during July to September to the Navy base at Key West, Fla.[8] The contract provided for the delivery of 72,000 quarts in paper containers and 7,500 gallons to be packaged in 5-gallon single service containers. This made a total of 102,000 quarts of concentrated grade A milk or 306,000 quarts of regular milk after being reconstituted. The contract price for the concentrated milk delivered in quarts at Key West was 51.98 cents per quart. This was subdivided as follows:

	Cents per quart of concentrated milk	Percent of total
Class I price for 3.4 percent grade A milk [1]	29.71	57.2
Dealers' gross handling margin [2]	15.95	30.6
Transportation: Chicago milkshed (Illinois to Key West) [3]	6.32	12.2
Total	51.98	100.0

[1] Average class I price for July to September 1951, the period covered by the Navy contract.
[2] This includes the cost for receiving, pasteurizing, homogenizing, concentrating, packaging, loading, and profit.
[3] Milk was hauled by the Refrigerated Transport Co., Inc., in a refrigerated truck. The rate charged was $2.53 per 100 pounds of weight, including the milk, containers, and cartons, with a minimum of 20,000 pounds.

Problems of shipment: When the first few loads of concentrated milk were shipped from Illinois to Key West, drivers found difficulty in keeping the temperature of the milk at 40° throughout the truck. Tests showed that although the temperature on the sides, front, and rear did not rise about 40°, the temperature of the cartons located on the floor went to 46°. The 6-degree rise was caused by the intense heat ranging from 85 to 115° reflected from the road. A 1-inch insulation on the bottom of the truck was not enough to prevent heating but when the cartons were separated from the floor by a 4-inch airspace, the problem was solved. This 5- or 6-inch space around the sides and top of the truck per-

[7] From statement of an executive of a chain of grocery stores in the Boston market in a letter dated August 21, 1951.

[8] The contract for the sale of concentrated milk from July to September 1951 between company X and the Navy was made on June 21, 1951, after bids had been submitted to the Navy. Some of the specific items included in this contract were:

A. Milk fat—not less than 9.85 nor more than 10.5 percent.
B. Total milk solids not less than 34.9 percent nor more than 37 percent.
C. Bacterial estimates—not more than 30,000 per gram.
D. Quarts of milk to be packed in paper containers—20 quarts per case.
E. Containers—sealed fiber VES shipping containers (5-gallon single service containers).
F. Concentrated product shall be pasteurized by heat to 155° F. and held for 30 minutes or to 170° F. and held for 15 seconds. Pasteurized concentrated milk shall be homogenized in such a manner as to insure breakup of fat globules to prevent creaming. When reconstituted with two volumes of distilled water, the product shall have a pleasant, fresh, pasteurized milk flavor.
G. Volume contracted:

7,500 gallons at $1.913	$14,347.50
72,000 quarts at $0.5198	37,425.60
Delivery f. o. b. Key West	51,773.10

H. Minimum quantity to be approximately 5,000 quarts and 500 gallons bulk.
I. Product to be loaded and delivered at approximately 40° F.
J. Destination inspection included in terms of contract.

mitted cold air to circulate to all parts of the truck, maintaining the milk at 40° or below. Four tests of temperature were made en route on each trip.

During the first 7 trips, leakers averaged 9 per trip out of a total of 6,000 quarts packaged in paper containers, about one-seventh of 1 percent. The highest number of leakers on one load was 40. Three of the seven loads had none at all. Reduction in the number of leakers was effected by putting a slightly heavier layer of paraffin on the containers.

The contract provided for shipment of 20 quarts per case. Officials of company X believe that decreasing the number of quarts to 12 per case would help solve the leaker problem if it again confronts them.

Consumer acceptance: Both Navy officials and company X report a high degree of acceptance of reconstituted concentrated milk at Key West. In the Navy mess the reconstituted product is made available in Norris dispensers and it is reported that sailors may take as many glasses as they want. Records are not available of the amount consumed per person.

Favorable reports from Boston and Key West coincide with tests made on an experimental basis. In October 1950, the National Dairy Products introduced concentrated milk in Wilmington, Del. Before venturing they tested the product thoroughly both in the laboratory and in the home. One hundred Philadelphia families were supplied with concentrated milk during a 30-day period. They reported approval of its flavor, richness, convenience, versatility, and keeping qualities. Of family members questioned, 95.7 percent either said they could tell no difference or preferred concentrated milk. Only 2.9 percent preferred regular milk.[9]

In April 1951, the University of Illinois conducted a taste test in which 334 people expressed their opinions concerning the difference between regular homogenized milk and concentrated milk. More than half were able to distinguish reconstituted milk from regular milk but they reported that the difference was very slight. Many preferred concentrated milk.[10]

How long will concentrated milk keep? Various tests have shown that high-quality concentrated milk before reconstitution under uniformly cold refrigeration will keep for at least 2 weeks. Since only 2½ days are required for shipping from Illinois to the most distant market on the Atlantic seaboard, the remaining 11½ days are ample for sale and distribution. When held at a low temperature, well-processed milk of high quality may keep even longer. On one submarine concentrate kept under refrigeration for 5 weeks was in good condition when reconstituted. Further experimentation will be necessary before the keeping time of this product can be predicted with certainty.

What are the potential savings to consumers in the use of concentrated milk? The greatest opportunities for selling concentrated milk from the Midwest are in the South and East where prices of regular milk are high. Potential savings ranging from around 3 to 6 cents per quart of regular milk were found to be possible in 12 markets in these areas (fig. 1 and table 1). These computations were based upon a comparison of the Navy contract price for the milk plus processing, and costs of transportation with present wholesale prices charged by dealers for milk sold to stores. Larger savings would be possible if the milk sold were of a lower butterfat content than that prevailing in these markets.

Major savings in home deliveries of milk would also be possible if deliveries were made once a week instead of every other day. Assuming a delivery cost of 6 cents per quart, 9 quarts a week on an every-other-day basis would cost 54 cents. Delivery of 3 quarts of concentrated milk at the same rate would cost 18 cents. A shift to once-a-week delivery of concentrated milk would save 36 cents, or 4 cents per quart of regular milk. This saving would, of course, be offset by the concentrating cost of a little over 1 cent per quart.[11]

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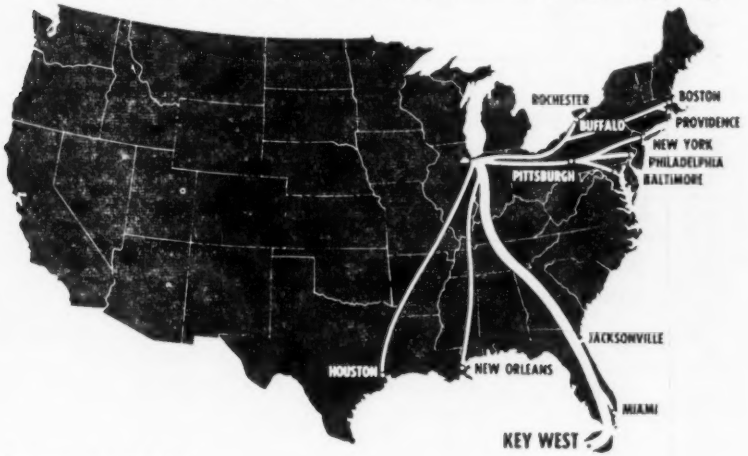
[9] See footnote 1, p. 1237.

[10] The results of this experiment are reported in the next article in this issue of Illinois Farm Economics.

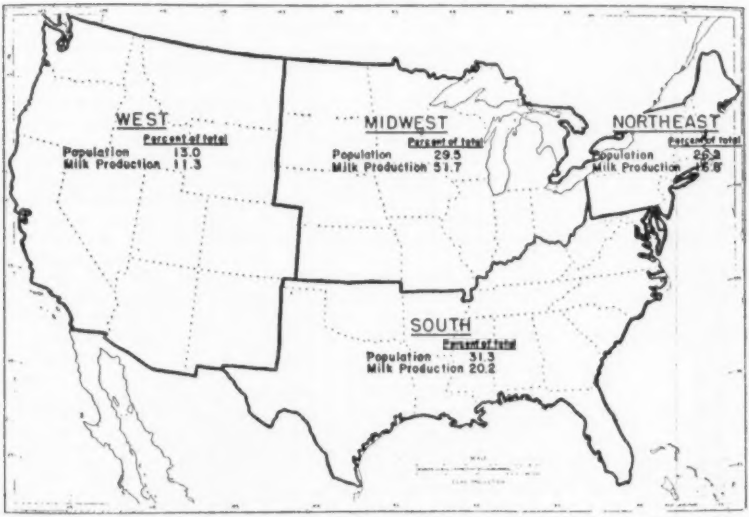
[11] Illinois Farm Economics, March–April 1951, p. 1134, table 1, footnoted.

FIG. 1. — ACTUAL AND POTENTIAL MARKETS FOR ILLINOIS CONCENTRATED MILK



Source: See Table 1.

FIG. 2. — DISTRIBUTION OF POPULATION AND MILK PRODUCTION, BY REGIONS, UNITED STATES, 1950



Source: United States Census of Population, Bureau of Agricultural Economics, USDA.

TABLE 1.—*Class I price to farmers plus costs of homogenizing, pasteurizing, concentrating, bottling, and transporting Chicago grade A milk to stores in specific markets compared with regular wholesale prices of milk at stores in these markets, August 1951*

Market	Chicago Class I price to farmers plus company X's gross handling margin [1]	Trucking cost [2] (cents per one-third quart of concentrated milk)	Total cost for 3.4 percent milk f. o. b. market [3]	Prevailing butterfat test of milk sold [4] (percent)	Adjustment at 8.0 cents per one-tenth point [4]	Price per quart of reconstituted milk with butterfat test of market [5]	Regular wholesale price of dealers to stores [6] (cents per quart of milk)	Potential savings to customers	
								Milk with prevailing butterfat test [5]	Straight 3.4 percent milk [7]
Jacksonville, Fla	15.22	1.37	16.59	4.25	1.46	18.05	24.00	5.95	7.41
Miami, Fla		2.11	17.33	4.00	1.03	18.56	23.00	4.44	5.67
Houston, Tex		1.61	16.83	4.00	1.03	17.86	22.00	4.14	5.17
New Orleans, La		1.18	16.40	4.00	1.03	17.43	21.00	3.57	4.60
Pittsburgh, Pa		.78	16.00	3.50	.17	16.17	21.00	4.83	5.00
Baltimore, Md		1.08	16.30	4.00	1.03	17.33	20.50	3.17	4.20
Rochester, N. Y		.87	16.09	3.50	.17	16.26	20.00	3.74	3.91
Providence, R. I		1.13	16.35	3.70	.52	16.87	20.00	3.13	3.65
Philadelphia, Pa		1.07	16.29	4.00	1.03	17.32	20.00	2.68	3.71
Boston, Mass		1.13	16.35	3.70	.52	16.87	20.00	3.13	3.65
Buffalo, N. Y		.80	16.02	3.50	.17	16.19	19.50	3.31	3.47
New York, N. Y		1.17	16.39	3.50	.17	16.56	19.50	2.94	3.11

[1] Contract price f. o. b. Illinois plant in Chicago milkshed between company X and U. S. Navy for concentrated milk to be shipped by refrigerated truck in quart paper containers to the naval base at Key West, Fla.

[2] Obtained through the courtesy of George L. Bowen, terminal manager, Refrigerated Transport, Inc., Chicago, Ill., in letter dated Aug. 23, 1951. Based upon minimum load of 20,000 pounds including 18,000 pounds of milk and 2,000 pounds tare.

[3] Sum of Chicago class I price of grade A milk of 3.4 percent butterfat content plus company X's gross handling margin, plus transportation costs f. o. b. cold-storage rooms in respective cities. The Navy contract calls for concentrated milk with a butterfat content between 9.85 and 10.5 percent. This averages 10.175 percent, or 3.392 percent when reduced to regular milk by dividing by 3. For convenience, a butterfat content of 3.4 percent is used in this table when showing facts relative to ⅓ quart of concentrated milk. This (3.4 percent) is approximately the butterfat content of this milk when reconstituted on a 3-to-1 basis.

[4] From U. S. Department of Agriculture Fluid Milk Reports, June to August 1951. The Chicago butterfat differential from July to September averaged 8 cents per 100 pounds per 1/10 point of butterfat. This figure was multiplied by the difference between the prevailing butterfat test of milk sold and 3.4 percent milk, and divided by 46.5 to get a per-quart basis. For example, Jacksonville's butterfat test was 4.25 percent, or 8.5 points above the 3.4 percent. 8½ times 8 cents divided by 46.5 equals 1.46 cents a quart. All data from these reports other than for class I price and fat adjustment, were for August 1951.

[5] Equals sum of price of 3.4 percent milk plus extra value of butterfat.

[6] Regular wholesale price at stores minus price per ⅓ quart of concentrated milk with the same butterfat content as that of the market.

[7] Regular wholesale price at stores minus price per ⅓ quart of concentrated milk of 3.4 percent butterfat content.

Potential savings in the use of concentrated milk were discussed by the president of a large dairy chain as follows:[12] "The big savings will come when shipping costs are cut in the deliveries from the processing plants to the distributing points and the various communities. And further savings will come when door-to-door milkmen have to make fewer trips, perhaps only one a week."[13]

What about milk supplies and potential returns to producers? Midwestern States in 1950 had 30 percent of the population in the country and produced 52 percent of the Nation's milk (fig. 2). Extension of markets from the Midwest to milk-deficient areas of the South and East will bring higher returns to producers, permit lower prices to consumers, and tend to result in higher per capita sales. For example, the sale of concentrated milk in Florida has meant that during July to September 1951, 657,900 pounds of milk produced in the Chicago area were diverted from what would have been class IV to class I use. With the difference between class I and class IV price of $1.31 per 100 pounds, this single contract provided increased returns of $8,618 to farmers in the Chicago milkshed.

Lower milk prices in southern and eastern markets are likely to increase per capita sales just as lower prices have increased them throughout Illinois in recent years.[14] Higher milk sales are particularly desirable in the Southern States where public health has been impaired because of inadequate diet.

Concerning the nutrition and health status of the South, Dr. Margaret G. Reid has stated: "Southern States have a relatively high proportion of families with low income and poor diets. In relative health standing all States of the South rank in the fourth or lowest quartile, except Oklahoma, Kentucky, and Florida which are in the third quartile."[15]

Although sales of milk in southern markets have increased in recent years, they are still materially lower than those in many of the midwestern markets. Per capita sales in New Orleans, for example, increased from 0.50 pint daily in 1940 to 0.59 pint daily in 1950.[16] The 1950 figure, however, was less than three-fourths that for Chicago (0.81 pint daily),[17] and certainly far under the daily quart for children and pint for adults recommended by nutritionists. Hence, expansion in the sales of low-cost concentrated milk in areas of high-cost milk is definitely in line with public interest.

Will expanding sales of concentrated milk be permitted? Will expansion in sales of concentrated milk be permitted by local groups such as dealers, labor organizations, State-control agencies, producer groups, and public-health agencies?

Although there are many institutional barriers still to be overcome, it seems to the author only a question of time before concentrated milk and other milk products shipped from low-cost areas will be accepted in most markets in the United States.

Several recent Supreme Court decisions have favored the future of concentrated milk by breaking down trade barriers and making possible free intermarket shipments of milk. These include 7 State supreme court decisions, 3 in Illinois, and 1 each in Texas, Arkansas, Iowa, and Michigan.[18] More recently the case of the Dean Milk Co. versus the City of Madison drew a ruling from the United States Supreme Court in January 1951.

Reduced to simple terms the essence of these decisions is:

1. The city has authority to set up requirements dealing with flavor and cleanliness.

2. The city has no authority to regulate the area from which milk is secured or where bottled or pasteurized, so long as it conforms to quality requirements.

3. A city has no authority to exact exorbitant fees which act as trade barriers.

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[12] Wall Street Journal, May 17, 1951.

[13] With once-a-week delivery, each route driver could handle 5 routes per 5-day week, instead of 2 routes on an every-other-day basis for a 6-day week.

[14] Illinois Farm Economics, October–November 1950.

[15] Food for the People. New York: John Wiley & Sons, Inc., 1943, p. 329.

[16] Data obtained through the courtesy of the New Orleans Federal Milk Market Administration. These data do not include skim milk, buttermilk, flavored and skim milk, and cream items reported in class I sales.

[17] Illinois Farm Economics, July 1951, pp. 1189–1195.

[18] The Illinois decisions were reported in Illinois Farm Economics, October–November 1950, pp. 1073–1084. The cases were: *Higgins* v. *City of Galesburg* (1948), *City of Rockford* v. *Heg* (1948), and *Dean Milk Company* v. *Waukegan* (1949). The other cases were: Texas, *City of Abilene* v. *Tennessee Dairies* (1949); Arkansas, *McClendon* v. *City of Hope* (May 1950); Iowa, *Miner* v. *City of Keokuk* (August 1950); and Michigan, *Grocery Co-op Dairy* v. *City of Grand Haven* (1950).

As long as we continue to live under a system of free competitive enterprise, a policy of intermarket shipments of concentrated milk seems fair to farmers, dealers, and labor. Both producers and dealers, however, agree that the people of the South and East must be protected by safeguards insuring the purity, flavor, and cleanliness of the milk they use. These safeguards may be in line with their own health standards. Dr. D. S. Robertson, director of milk sanitation of the city of San Antonio, Tex., has suggested the following requirements: (1) bacteria count not more than 200,000 in raw milk and not more than 30,000 for pasteurized milk; (2) hemolytic count below 1,000; (3) acidity not over 0.15; (4) good flavor; (5) temperature 50° or under; and (6) no adulteration.

From the viewpoint of the public, expanded sales of concentrated milk will mean higher per capita sales of milk and consequently a higher national health rating. The producer, too, will benefit by the increased income from class I milk and the dealer will have a new and profitable product to sell.

R. W. BARTLETT.

EXHIBIT I–B

ONCE-A-WEEK HOME DELIVERY OF FRESH CONCENTRATED MILK

C. A. Iverson[1]

Two years ago Professor Iverson was invited to a market milk clinic at Cincinnati, Ohio. There he was asked to judge 3 samples of milk, and he was surprised to find that reconstituted concentrate was the best of the 3. That stimulated work with concentrated milk at Ames, Iowa.

Process: It is necessary to start with high-quality milk. The milk is pasteurized, homogenized, put through the vacuum pan, and reduced to 3 to 1 concentrate, and then pasteurized and homogenized a second time.

In about 700 taste tests, about two-thirds of the people preferred the concentrate to regular milk.

Merchandising: In merchandising the product, it was decided to try to sell to farmers in order not to compete directly with local fluid-milk plants. The selling is done through a vendor who buys the product f. o. b. the plant.

There was also the problem of how to sell. Interest in the product was stimulated by mixing soda pop with the fresh concentrate.

Five routes, each for a different day, were established. This plan allowed 1 day a week to catch up in case of bad weather. However, there has been only 1 day so far that milk could not be delivered.

The concentrated milk is delivered in a three-fourths ton truck with a specially designed magnesium body. The body itself weighs about 900 pounds, and the refrigeration unit about 600 pounds. The truck is designed to minimize road shocks and can be driven 60 miles an hour on open roads. The truck body has compartments for both ice cream and milk, with a capacity of 200 quarts of concentrate in the milk compartment. The ice-cream compartment is accessible from either side, so it is easy to locate different flavors.

The combination of ice-cream and concentrated-milk sales is considered essential. On these routes ice cream makes up about 40 percent of the volume and concentrated milk 60 percent. Other dairy products are also sold in very limited amounts.

The vendor can serve up to 70 or 80 customers per day; moreover he has time to promote sales. Professor Iverson feels that this emphasis on merchandising is important.

Average daily sales of concentrated milk total about 150 quarts. The vendor buys the concentrated milk at 48 cents a quart at the plant and now sells it for 60 cents, which is equivalent to the prevailing price for regular milk in town. Thus the only saving to the consumer is that milk is delivered. Ice cream is sold at $1.60 a gallon at the plant. With operations at this level, the vendor has cleared in excess of $300 a month.

The concentrated milk is made twice a week on a small scale. On this basis processing costs have amounted to about 3.6 cents per quart of concentrated milk, equivalent to 1.2 cents per quart of regular milk. If operations were on a larger scale, processing costs would probably be less than 1 cent per quart of milk equivalent.

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[1] Head, department of dairy industries, Iowa State College, Ames.

During most of 1952, Iowa farmers were feeling the effects of reduced income attributable to the poor 1951 corn crop. Despite this fact, sales of concentrated milk increased materially during the year, as is shown in the accompanying graph. Ice-cream sales, however, were no greater in the fall of 1952 than they had been in the fall of 1951. About one-third of the total quantity of ice cream has been sold in gallons, about two-fifths in quarts, and most of the rest in half gallons. In 1952 ice cream sales were heaviest in July, but were at two thirds of the July level in December.

The only criticism of the concentrated milk has been that it "tastes too rich." Some persons dilute it more than 2 to 1.

On over 500 farms where it has been tried, only 1 case has been found where water influenced the taste of the reconstituted milk materially.

Professor Tracy pointed out that the milk is pretty well buffered—it will absorb considerable taste without much effect.

Among advantages of the concentrate are (1) it is compact for storage in the home refrigerator, (2) it is more easily digested by some people than regular milk, and (3) its multiple-use characteristic permits it to be used undiluted in coffee and mixed with the juices of cooked vegetables in creaming, thereby preserving their full nutritive value.

Mr. BARTLETT. I would like to read a little about one thing I referred to under No. 6. It is on page 7 of this New Techniques and Products dealing with the school-lunch program. This is one of the suggestions as to how to increase sales of milk through schools.

This is the last paragraph on page 7 of New Techniques and Products.

In October 1951, there were 29,846,000 students enrolled in American public schools. If, during school hours, each student drank one-half pint daily for 180 days, this would use 45 quarts of milk per student, or a total of 2,888,000,000 pounds of milk annually. Actually in the school year of 1951–52, consumption per student was only 12 quarts, or only about one-fourth of the above estimate. Why? Bad quality? Warm milk? Too high price? Lack of electric refrigeration? Lack of vending machines? Lack of Norris dispensers? Competition with candies and sweet beverages? These and other factors might well be studied.

Then going over to page 8: At its 88th annual meeting in May 1952, the executive council of the Illinois State Dental Association unanimously adopted the following resolution:

Whereas leading dental research workers and scientists have practically universally reached the definite conclusion that the intake into the amount of refined sugars and foods made therefrom are the primary contributing cause of dental caries; and

Whereas despite the great increase in dental-health education and more universal dental care of our children, the caries rate steadily increases; and

Whereas since we members of the dental profession should be, and are, the most interested group concerned in the control of dental caries and the improvement of dental health; and

Whereas since in many, if not most, of our primary schools the pupils are allowed to purchase sugar-containing confections and beverages without any restrictions and with the implied approval of our school systems and school authorities: Therefore be it

Resolved, That the Illilois State Dental Society go on record as condemning the sale of candies, gums, and sweetened beverages in all primary schools in the State of Illinois and favoring substituting therefor such sugar-free foods as nuts, potato chips, and milk.

It seems to me they have made a real point. They have given a hand to this school milk program.

The school-lunch program is to be studied by the dairy marketing specialists in the north-central region. There are good possibilities

of doubling or tripling per capita sales of milk in schools. Results of the regional study should be made available to congressional committees and others as soon as they are released. It may be necessary to increase the funds for this program.

There are three States—Michigan, Ohio, and Illinois—which are going to take the lead in a study of this school-lunch program while several other States have indicated their willingness to obtain information. The purpose is to find out why some schools have a very high per capita sales and some have not. I think this is one of the avenues of quickest approach for increasing milk sales, since you can get a whole lot of organized people who are interested. For example, the State superintendent of education in Illinois voluntarily asked the president of our largest dairy cooperative: "What can we do?"

If we give him a program of what he can do with the reasons why milk sales are low in some schools and high in other schools, then he can go ahead and get the cooperation of many groups to aid in increasing milk sales in schools.

If there are no questions on that, I will go now to the No. 2 point on this. This refers to Illinois Farm Economics of June 1953, pages 1484 to 1487.

With your permission I would like to have that included as exhibit II, and I will read 2 or 3 points from this.

Mr. ANDRESEN. That will be included in the record.

(The information is as follows:)

EXHIBIT II

[Illinois Farm Economics, June 1953, No. 216]

INCREASED INCOMES AND LOW STORE PRICES: THE KEY TO HIGHER PER CAPITA MILK SALES IN THE CHICAGO MARKET

Milk sales in the Chicago market from 1902 to 1952 can be divided roughly into three periods:

1902–30: During most of this period the market was under the influence of a trade association monopoly which established store prices to consumers at the same level as prices for home-delivered milk. In contrast, consumers in New York during this same period could buy milk at stores in bulk at 4 to 5 cents a quart below the home-delivered bottled price.

1931–39: Between these dates the controls which had prevented low-priced store milk in Chicago were broken. It is reported that the dairy chiefly responsible for this action was owned by Al Capone.[1]

1940–1952: Since 1940 there has been plenty of competition in Chicago, and the market has no legal trade barriers to prevent the sale of low-priced grade A milk.[2] This situation is in sharp contrast to that in about three-fourths of the cities and villages in the United States which still have either a 1-cent store differential or charge as much for store milk as for home-delivered milk. This factor should be considered in attempting to analyze reasons for changes in per capita milk sales.

Some changes which have taken place in the Chicago market are:

1. Per capita sales of milk increased from 0.60 pint daily in 1940 to 0.78 pint in 1952, an increase of 30 percent. In recent years, milk sales in Chicago have increased faster than in the United States (fig. 1), and in 1952 were only 4 percent less than in New York.

2. The average price to consumers in 1952 was 22.6 cents per quart or 62 percent above that for 1929 (14 cents). The price per quart in gallons in 1952 averaged

[1] Federal Trade Commission Report: Chicago Sales Area (H. Doc. 451 (1936), p. 18).

[2] The 12 States which still have consumer price fixing are Maine, New Hampshire, Rhode Island, Vermont, Alabama, Florida, Virginia, California, Montana, Oregon, New Jersey, and Pennsylvania. Exaction of fixed consumer prices in these States has effectively curbed the competition of the gallon jug, such as exists in Chicago and Akron.

only 42 percent above that for 1929, and in highly competitive areas was much lower. In contrast, prices of all foods in Chicago increased 81 percent during the same period.

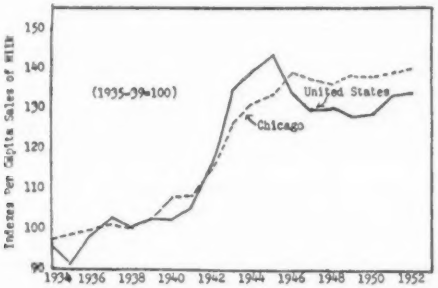

FIG. 1. INDEXES OF PER CAPITA SALES OF MILK, CHICAGO AND UNITED STATES, 1934-1952
(Source: Federal Milk Market Administration and U. S. Department of Agriculture)

3. In 1929 both the store price and home-delivered price were 14 cents per quart. By 1952, as a result of keen store competition, the price in gallon jugs averaged 19.9 cents per quart (79.5 cents per gallon), or 2.7 cents less than the average price (22.6 cents) and 5.4 cents less than the home-delivered price of a single quart (25.3 cents).

4. Keen store competition has resulted in passing on quickly to consumers the lower prices received by farmers. The class I price to farmers in May 1953 was 2.7 cents per quart less than in November 1952, when the price per gallon in stores ranged from 16.5 cents to 21 cents per quart. By May 1953 the gallon price had been reduced to 14.25 cents per quart in some stores while the usual price at chain stores was 18.25 cents. Thus, the May 1953 gallon price was 10.25 and 6.25 cents per quart respectively less than the price per single quart of home-delivered milk (24.5 cents).

5. Store sales increased from 6 percent of total sales in 1930 to around 70 percent in 1952, or about the same proportion as for New York. For the United States, store sales in 1952 were about 45 percent of total milk sales.

6. Sales in half gallons, paper and glass, increasesd from 18.7 percent of total sales in April 1946 to 36.9 percent in April 1953. The half-gallon paper container was first used in Chicago in the summer of 1949. Half-gallon sales increased from 23.2 percent of total sales in April 1949 to 34.5 percent in April 1950 (table 1).

TABLE 1.—*Distribution of milk sales in the Chicago market, by size of containers for April, Years 1946 to 1953* [1]

	1946	1947	1948	1949	1950	1951	1952	1953
Quarts	61.5	61.2	59.7	58.8	46.4	40.0	35.5	31.6
Half-gallons	18.7	18.8	21.0	23.2	34.5	35.7	35.9	36.9
Gallons	11.6	11.7	11.2	11.3	12.7	17.4	21.9	25.0
Pints, third-quarts, and half-pints	8.2	8.3	8.1	6.7	6.4	6.9	6.7	6.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Based upon information assembled by the Chicago Federal Milk Market Administration. Data from 1946 to 1948 for Chicago Federal Order 41 from Reporter, July 1951. Data for Chicago and suburban areas for 1949 to 1952 from Reporter, May 1952. Orders 41 and 69 were combined on July 1, 1951. Data for April 1953, from letter of May 25, 1953, from A. W. Colebank, Chicago Market Administrator.

7. Sales in gallon jugs increased from 11.6 percent of total sales in April 1946, to 21.9 percent in April 1952 and 25 percent in April 1953. Chicago now ranks second to Akron, Ohio, where it is reported that 50 percent of milk sales in 1952 was distributed in gallon jugs.[2]

[2] American Milk Review, November 1952, pp. 46–48.

8. Sales in paper containers in the United States increased from 4.8 percent of the total in 1940 to 38.5 percent in 1952. It is estimated that 40 percent of the milk sold in Chicago in 1952 was distributed in paper containers, or about the same as the national average.

9. Consumer income in Chicago increased from $607 per person from 1935–39 to $1,758 in 1952, or nearly three times. When corrected for changes in purchasing power, Chicago consumers in 1952 had $1.49 for each dollar in prewar years.

Influence of retail milk prices and disposable income upon per capita sales of milk: While it is generally agreed that consumer income affects per capita milk sales, a question frequently raised among students of dairy marketing is: "To what extent does price affect per capita sales?" With heavy surpluses now available all over the United States an accurate answer assumes increasing importance.

An analysis of milk sales in the Chicago market between 1940 and 1952 indicated that average retail milk prices (adjusted) and per capita disposable income (adjusted) were the major factors affecting sales (table 2). The coefficient of multiple correlation for this period with per capita sales lagged 1 year as the dependent variable, and milk prices (adjusted) and disposable incomes (adjusted) as the independent variables, was 0.989.[4] Adjusted income was slightly more important than adjusted price in influencing changes in per capita sales of milk.[5]

Similiar studies of other markets will be necessary to determine if the results for Chicago are true generally. If such studies substantiate these results several questions may well be raised.

TABLE 2.—*Per capita sales of milk, retail prices of milk, retail prices of all foods, disposable income, and consumers' price index, Chicago, 1940–1952*

Year	Daily per capita sales of milk, Chicago [1]	Average retail price of milk, per quart, Chicago [2]	Indexes of retail prices of all food, Chicago [3]	Average retail price per quart of milk adjusted for prices of all food, Chicago [4]	Disposable personal income per capita, Chicago [5]	Consumers' price index Chicago [6]	Deflated disposable personal income per capita, Chicago [7]
	Pints	*Cents*	*1935–39=100*	*Cents*		*1935–39=100*	
1940	.600	10.89	96.7	11.3	$703	100.6	$699
1941	.600	12.69	106.2	11.9	840	105.7	795
1942	.635	13.55	122.9	11.0	988	116.3	850
1943	.701	15.15	136.0	11.1	1,078	122.8	878
1944	.730	15.09	125.0	11.2	1,184	124.7	949
1945	.741	15.03	137.8	10.9	1,244	127.3	977
1946	.770	17.40	160.1	10.9	1,324	138.4	957
1947	.763	19.35	197.5	9.8	1,425	160.8	886
1948	.757	20.81	215.2	9.7	1,586	174.9	907
1949	.767	19.36	207.4	9.3	1,483	174.5	850
1950	.767	19.31	209.4	9.2	1,595	176.7	903
1951	.773	21.19	233.3	9.1	1,707	190.6	896
1952	.777	22.62	237.0	9.5	[8] 1,758	195.0	902

[1] Computed from data of Chicago Market Administrator, Order 41 Reporter; Order 69 Market News, and U. S. Census of Population.

[2] Estimates of weighted average prices to consumers. Data from USDA Fluid Milk Report, Illinois Farm Economics, July 1951, pp. 1189–1195; Chicago Federal Milk Market Administration; Pure Milk Association; and specific distributors in the Chicago market.

[3] U. S. Bureau of Labor Statistics, Retail Prices of Foods.

[4] Column 2 divided by column 3.

[5] "Survey of Current Business," August 1952, p. 17, data for Illinois. Since the trend of bank debits for Illinois cities outside Chicago closely paralleled those for Chicago, per capita personal income for Illinois (less Federal individual income and fiduciary taxes) were used.

[6] Bureau of Labor Statistics, Handbook of Basic Economics Statistics, March 1953.

[7] Column 5 divided by column 6.

[8] Estimate based on 3 percent increase in Chicago bank debits per capital from 1951 to 1952.

1. How can the method used in Chicago of quickly passing on to consumers the lower prices received by farmers be extended to milk markets generally?

[4] The standard error of estimate was 0.003.

[5] The Beta coefficient for per capita milk sales and adjusted disposable income (other variable being held constant) was +0.714. The Beta coefficient for per capita milk sales and adjusted retail milk prices (other variable held constant) was −0.528.

2. If class I prices are materially above their competitive level, what can be done to reduce them and to pass reductions on to consumers?

3. What are the best ways to bring about price competition in markets which still charge as much for milk at stores as for home-delivered milk or have only a 1-cent store differential?

4. Are laws which fix consumer milk prices and which prevent efficient distributors from lowering them desirable from a public viewpoint?

Positive answers to these questions are essential if per capita milk sales are to be increased to the amount recommended by nutritionists and if the dairy industry is to stop the downward trend in per capita milk utilization since 1942.* With a forward-looking leadership in the dairy industry, the chances are good for bringing about the desired objective of higher per capita milk sales.

R. W. BARTLETT.

Mr. BARTLETT. A few highlights of this article are:

Sales of milk in gallon jugs now constitute 25 percent of total milk sales in the Chicago market. In May 1953, milk could be obtained at 57 cents a gallon (14.25 cents per quart) in some parts of Chicago, while the usual chain store price was 18.25 cents per quart or 6.25 cents less than the price per single quart of home-delivered milk (24.5 cents).

In 1952, the price of milk in gallon jugs averaged 42 percent above the store price in 1929. This compared with an increase of 81 percent in the price of all foods in Chicago.

I would like to add 1 or 2 more comments on that. The per capita sales of milk have increased faster in Chicago than in the United States. That is shown in figure 1, page 1485.

Personally, I think that this increase in per capita sales of milk in Chicago faster than in the United States is directly related to this high degree of competition in the retail sales of milk in Chicago. Store sales increased from 6 percent of the total sales in 1930 to 70 percent in 1952. Seventy percent of all milk in Chicago now goes out through stores.

Twenty-five percent of Chicago's milk is sold in gallon jugs, which are very highly competitive. Thirty-seven percent of all milk in Chicago goes out in half gallons, which are also highly competitive. About 40 percent of milk sales to Chicago consumers are bottled in paper containers.

Between November 1952 and June 1953 lower class I prices have been reflected quickly in lower prices of milk sold in gallon jugs and in half gallons. To me that is a very important point. The farmers are much less worried when their price goes down if the consumer price goes down with it, but they do not like to have their price go down and the dealers' margin widened. I think you will agree with me on this.

Mr. ANDRESEN. Let me ask you this: Do you have a milk marketing authority in Chicago?

Mr. BARTLETT. A Federal milk order has been in Chicago since September 1939.

Mr. ANDRESEN. Does that milk marketing authority regulate the price and the distribution of milk?

Mr. BARTLETT. No. No Federal order in the United States has anything to do with consumer prices.

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*In 1952 sales of milk in all forms in the United States was 743 pounds per person or 11.5 percent less than in 1942 (839 pounds).

Mr. ANDRESEN. I mean the price to the producer.

Mr. BARTLETT. Prices to the producer they regulate. In Chicago the class I price since November 1935, has been tied directly to the manufacturing price. It has gone up and down month by month, with the manufacturing price.

In September 1939 the class I price was $1.99 per 100 pounds of 3.5 milk.

Mr. ANDRESEN. How much was that?

Mr. BARTLETT. $1.99.

Mr. ANDRESEN. $1.99.

Mr. BARTLETT. It went up to $5.28 in August of 1948. It went down to $3.70 in August 1949. It followed the condensery price up and then it followed it down. Then it has followed it up again and is following it down. This policy has resulted in acceptance by both producer and distributor groups in Chicago.

The result of this flexible pricing method is that we have never had what I would call a monopolistic class I price since the Federal order has been in use in Chicago. The class I price has been kept within its competitive bounds. That is something which is not true in some other Federal orders, which I will discuss a bit later. To me that is the only sound thing to do; and Mr. Louterback, who was the manager of the Pure Milk Producers' Association, agreed with me on that point.

The class I price was tied to the condensery price between November 1935 and August 1939 before the Federal order came into being. Then the Federal order adopted that pricing method in September 1939, and it has continued through to the present time with the addition of some minor changes as needed.

Mr. ANDRESEN. What is the class I price for the month of June?

Mr. BARTLETT. The class I price in Chicago for the month of June is not shown in the Reporter for May 1953. The May price was $3.85 per hundred pounds of milk.

Mr. ANDRESEN. Was that for 3.5 milk?

Mr. BARTLETT. Yes. 3.5 milk in the 70-mile zone. You see, what they do is this: They have premiums above the condensery or butter powder price, higher in one season than the other. The May and June price is 60 cents per 100 pounds of milk above the butter powder or condensery price, whichever is higher. The premium from July to November is $1.10 above these prices. From December to April it is 80 cents a hundred pounds.

Then in addition, we have what we call the supply demand premium. If the milk supply is too small the premium increases and if it is too large the premium decreases.

When the supply-demand premium was put into effect in July 1951 the milk supply in relation to sales was short and it increased the price above these fixed premiums. In the past 5 months because of this abundant supply you referred to, Mr. Andresen, there has been a deduction. In June the deduction was 12 cents below the 60 cents, or 48 cents above the butter powder price. In July it will be off 15 cents, because the volume of production in relation to class I and class II sales is still high.

So the essence of the Federal order program in Chicago has been to tie the class I prices to supply-and-demand conditions. This sup-

ply-demand premium is based upon class I and II volume over the total milk receipts. We have a constant which is 72.

If the volume of class I and class II sales is 72 percent of total milk receipts for the preceding 12 months, nothing added or subtracted in these three seasonal premiums: If sales fall below 72, for each percent that they fall below, 3 cents per 100 pounds is deducted. In July class I and II sales fell to 67 percent of milk receipts for the 12 preceding months. We have a 12 months moving average; 72, the constant, minus 67 is 5 percent. Five times 0.03 is 15 cents; 15 cents is to be deducted from the July premium of 80 cents, which would make it 65 cents over the butter powder price for July.

Under this Federal order in Chicago there is a very close relationship to supply and demand conditions which does not exist in some other Federal orders which I will discuss a bit later.

Mr. ANDRESEN. On the basis of $3.85 a hundred, that would be between 7 and 8 cents a quart, or about 8 cents a quart.

Mr. BARTLETT. Yes. In order to compare that price with other markets, since this is at the 70-mile zone, you have to add the country plant and transportation charge from the 70-mile zone to the city. That is about 40 cents a hundred pounds.

Mr. ANDRESEN. Of course, the producer did not get that.

Mr. BARTLETT. No, that is true.

Mr. ABERNETHY. What is the retail price for a quart of milk at Chicago?

Mr. BARTLETT. There are about 50 retail milk prices in Chicago.

Mr. ABERNETHY. 50 cents a quart?

Mr. BARTLETT. No. There are about 50 retail prices. Chicago is a highly competitive market. Which price do you want? I will give you the lowest and the highest.

Mr. ABERNETHY. What does a quart of milk cost delivered to the door?

Mr. BARTLETT. A single quart costs 24½ cents.

Mr. ABERNETHY. 24½ cents.

Mr. BARTLETT. The lowest price, and this was reported to me by the manager of the Pure Milk Association, in June was 57 cents a gallon, or 14¼ cents a quart.

Mr. ABERNETHY. In other words, it costs 16½ cents to bottle and ice and deliver the milk?

Mr. BARTLETT. No; because probably less than 5 percent is sold at that 24½ cents; 70 percent of all the milk in Chicago is sold through stores today.

Mr. ABERNETHY. What does it sell for at the stores?

Mr. BARTLETT. That is the information that I was giving you a moment ago, and I have included it here. The usual store price today—I am talking about chains, like the Jewel Tea, National Tea, A. and P., Kroger, and so forth——

Mr. ABERNETHY. Yes.

Mr. BARTLETT. Is 73 cents a gallon. That is 18¼ cents a quart. Then there are other competitive stores where it gets down to 57 cents a gallon. That is 14¼ cents a quart.

Mr. ANDRESEN. Are they really selling milk?

Mr. ABERNETHY. You are teaching me something. Can you tell me whether or not milk can be bought here at such a price?

Mr. BARTLETT. There are very few places in the United States which have as low a price. The lowest price in the United States I know of is Akron, where about half the milk sold is in gallons at 52 cents in stores. You can buy milk there at 13 cents a quart.

Mr. ANDRESEN. That is, a place in Ohio.

Mr. BARTLETT. That is Akron, Ohio. In Chicago 25 percent of the milk is sold in gallon jugs at low prices. In Akron about 50 percent is going in gallon jugs at 13 cents a quart. That price is lower than the lowest gallon price reported for Chicago, 14.25 cents.

I am not advocating that the gallon-jug sales should necessarily be encouraged, but I am interested in the fact that consumers are getting a bargain on the gallon-jug price. This low price exists only in highly competitive markets.

Mr. ABERNETHY. I do not want to be misunderstood. I am not inquiring for the purpose of seeing who is getting rich and who is making money. I am not too familiar with this, as my friends here are. I just wanted to make some comparisons.

Mr. ANDRESEN. You know, over a period of years I have received information that in the Chicago market some of the milk drivers were receiving as much as $15,000 a year.

Mr. BARTLETT. Yes, that is true, but only for a very few wholesale drivers, probably less than 5 percent. And it may be of interest to you to note that a few drivers in Washington also get over $12,000 a year.

Mr. ABERNETHY. In other words, it is better to deliver it than it is to produce it?

Mr. BARTLETT. For these drivers; yes. For most drivers that is not true. Of course, we are all interested in narrowing margins for distributing milk. I want to discuss that a moment later, if you will hold that question.

Mr. ANDRESEN. Yes, sir.

Mr. BARTLETT. That will come under No. 4.

Mr. ANDRESEN. You are speaking about grade A milk?

Mr. BARTLETT. I am talking about grade A milk; that is right.

Mr. ANDRESEN. Very well.

Mr. BARTLETT. Of course, when we discuss any one of these things it jumps over into one of the others. You cannot help it. We do not have to be entirely consistent.

I have included these in six categories, and I have made specific comments concerning them under each category. With your permission now I will go ahead with the second phase of this, and that is this question of the changing pattern of milk distribution, which is included in April 1, 1952, issue of Illinois Farm Economics, pages 1340 to 1347.

The essence of it is that we had this out-of-market milk supplied by vendors. A vendor is a person who buys milk at the platform of a dealer and then sells it where he wishes at the price that he wishes. We made a study of eight downstate Illinois markets. In March 1948, a vendor of the Dean Milk Co., located in the Chicago milkshed, came into Champaign-Urbana and began selling milk at 2 cents a quart below the regular store price. Up to this time the store price and the home-delivered price had been the same.

This same type of outer-market distribution is now permeating all of Illinois. I might state parenthetically that we have just finished a study of 13 North Central States. This outer-market distribution

bottling it in one plant and distributiong it 100 or 200 miles from that plant, is general throughout all the North Central region.

Mr. ANDRESEN. They are not within the milkshed?

Mr. BARTLETT. They can be entirely outside the milkshed; that is right. The Dean Co. milk comes from Chemung, Chicago milkshed, to Champaign-Urbana, which is 165 miles south, every day. Milk from this same company is sold by a vendor in Dubuque, Iowa. This company sells milk from its Chicago bottling plant in markets in four different States which are entirely outside the milkshed.

Mr. ANDRESEN. Is one reason for that, Professor Bartlett, due to the fact that there has been a decrease in the production of butter?

Mr. BARTLETT. I do not think there is any relation, Mr. Anderson, between butter sales and these out-of-the-market milk sales in the Chicago area.

(Exhibit III, follows:)

EXHIBIT III

[Illinois Farm Economics, April 1952]

THE CHANGING PATTERN OF MILK DISTRIBUTION

Until recent years, milk sold in most Illinois markets was produced within a milkshed adjacent to each market. Now, however, shipments of milk from a centrally located bottling plant may include markets as far away as 200 miles.[1] Many of the larger markets in Illinois are receiving milk from sources outside their local milksheds. In Illinois, the expansion of intermarket shipments of milk on a State basis began in 1948. In that year, the Dean Milk Co. of Chicago initiated a program of supplying milk in paper containers to many markets from their shipping point in Chicago.

Since that time, there has been a very rapid development of intermarket shipments. In Champaign-Urbana alone, five companies from other markets now regularly furnish milk for stores. These include: Dean Milk and Borden of Chicago, the Producers' Daily of Danville, Roszell from Peoria, and Beatrice Foods from Bloomington.

In June 1951, 9 percent of sales of milk packaged in Chicago were made outside the local marketing area.[2] Ordinarily, this milk would have been utilized as class IV milk (butter or cheese). Its inclusion in class I ment $1.02 per 100 pounds more for Chicago producers, a total gain of $1,551,000 through outside market shipments. Because of increased per capita sales in most markets, this did not reduce sales of locally produced milk.

The growth of intermarket shipments of milk may be attributed to: (1) An ever-increasing mileage of improved roads; (2) the use of paper containers; (3) the lifting of legal barriers against intermarket shipments; and (4) the introduction of store prices 2 cents or more a quart below the home-delivered prices.

Improved roads: In 1951, Illinois had 29,749 miles of concrete, macadam, or high-type surfaced roads, compared with 435 miles in 1918.[3] In addition, gravel roads in many parts of the State are usable for trucking the year round. Improved roads have made possible the use of large refrigerated trucks capable of transporting high-quality milk for long distances. One truck used for hauling Illinois milk a distance of 1,700 miles to Florida, in 1951 had an average load of 8,000 quarts.[4]

Increased use of paper containers: The use of paper containers for packaging milk has increased greatly since 1940. According to statistics assembled by the Pure-Pak division of the Ex-Cello Corp., 71 percent of the milk sold throughout the United States by grocery stores in 1950 was packaged in paper containers, and 29 percent in glass bottles. Pure-Pak reported that in 1940 only 4.8 percent of all milk sold in villages and cities was packaged in paper containers. By 1950, this percentage had increased to 31.2. Because of the use of paper con-

[1] Prof. Edward H. Ward, of Montana State College, reports shipments of milk in paper containers as far as 600 miles from the bottling plant in his State in letter dated February 4, 1952.
[2] Based upon audits of the Chicago Federal Milk Marketing Administration.
[3] From Illinois Division of Highways in letter dated January 14, 1952.
[4] Illinois Farm Economics, October 1951, p. 1238.

tainers intermarket shipments of milk have increased through simplifying transportation problems and facilitating store sales of milk. As yet, only a very small volume of milk distributed to homes is packaged in paper containers.

Legal decisions: Since milk is highly perishable most cities have ordinances regulating its quality. Sanitary regulations, which were originally set up to control quality, in more recent years have been used in more and more markets as trade barriers to prevent shipments of milk from outside areas. This situation is unique since of some 2,000 items handled in a food store, milk is the only food sold in large quantities in the United States against which legal barriers have been created to prevent free intermarket shipments. These barriers have not been limited to one area or region, but have been found in markets scattered all over the country.

Illinois has taken the lead in breaking down these barriers. Three decisions of the Illinois Supreme Court have indicated that the city has no authority to regulate the area from which milk is secured or where bottled or pasteurized so long as it conforms to quality requirements.[5] Decisions in four other States and a ruling of the United States Supreme Court hold essentially the same viewpoint. The growth of intermarket shipments throughout Illinois and in these other States is now established on a firm legal foundation. It is likely, however, that further decisions of the United States Supreme Court will be necessary before all groups become convinced of the legality of interstate shipments of packaged grade A and other high-quality milk.

PER CAPITA MILK SALES INCREASE IN ILLINOIS MARKETS RECEIVING OUT-OF-AREA MILK

Legal decisions, paper containers, and improved roads which paved the way for intermarket shipments of milk throughout Illinois, have changed the pattern of milk distribution within the State. Markets in southern Illinois, sometimes known as Little Egypt, are now regularly supplied by five plants which distribute milk throughout most of this area. St. Louis and nearby dairies have broadened their distributing outlets to outlying markets, and, as stated, dairies in Chicago and central Illinois now regularly distribute milk to neighboring towns and cities. With this change in the pattern of milk distribution come certain questions: Of what value has this change been from the viewpoint of the public? From the viewpoint of farmers?

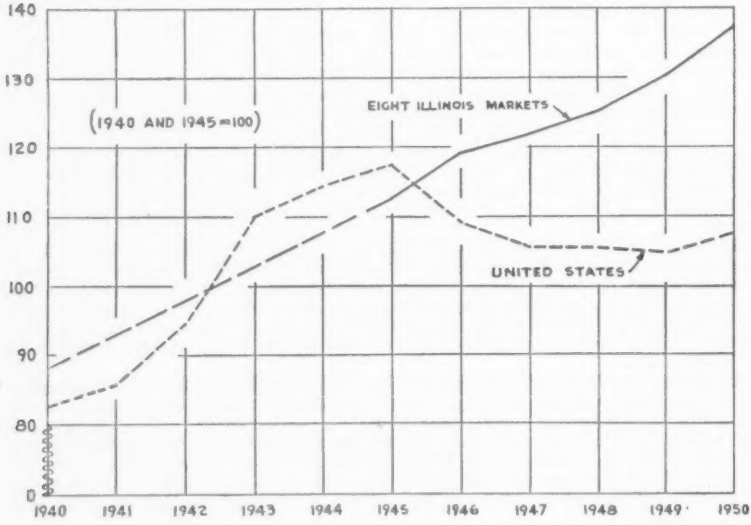

FIG. 1. — INDEXES OF CHANGES IN PER CAPITA SALES OF MILK, EIGHT ILLINOIS MARKETS AND UNITED STATES, 1940 TO 1950

[5] The Illinois decisions were reported in Illinois Farm Economics, October-November 1950, pp. 1073–1084.

TABLE 1.—*Per capita sales of milk in 8 Illinois markets, 1940, 1945 to 1950* [1]

[Pint daily]

Market	1940	1945	1946	1947	1948	1949	1950	Percent change 1945 to 1949 [2]
Bloomington	0.506	0.599	0.718	0.731	0.730	0.741	0.803	+24
Champaign-Urbana	.543	.661	.709	.774	.802	.814	.909	+23
Danville	.743	.888	.875	.873	.957	.991	.870	+12
Decatur	.542	.853	.835	.755	.737	.766	.840	−10
Peoria	.510	.673	.727	.750	.764	.832	.866	+24
Quad Cities	.600	.778	.780	.839	.869	.880	.908	+13
Quincy	.588	.706	.717	.796	.827	.831	.856	+18
Springfield	.497	.686	.779	.781	.775	.839	.944	+22
8-city average	.566	.730	.768	.787	.808	.837	.874	+15
Index (1940–45=100)	88	113	119	122	125	130	136	

[1] Illinois Farm Economics, October–November 1950. See footnote 1, page 1073 for source of data.
[2] Used as basis for comparison with consumer prices for the same period.

Increased per capita consumption of milk aids in improving health since present consumption is materially below that recommended by nutritionists for an adequate diet. Data on per capita sales of milk available for eight Illinois cities indicate that intermarket shipments have been an important factor in increasing milk sales in these markets. From 1945 to 1949 per capita sales of milk in the 8 markets increased 15 percent at the same time that those for the United States decreased 10 percent (table 1 and fig. 1). This increase in milk sales was directly associated with an increase in store sales resulting from the introduction of a store differential.

In 1945 the store prices and the home-delivered prices in each of the eight markets were the same (table 2). By 1949 each of the eight markets had a store price 2 cents a quart below that of home-delivered milk. Higher per capita sales increase returns to farmers since the price for class I milk is higher than for milk manufactured. While prices received for manufactured milk vary somewhat in different markets, on the average producers would have received about $1 per 100 pounds more if the entire volume had been sold as class I.

Champaign-Urbana milk sales increase: The situation in Champaign-Urbana illustrates what has happened to the distribution pattern. One group of 10 stores in this market each day now (1952) sell about 500 quarts of milk per store, most of which is received from Chicago. The bulk of this is sold in one-half gallon paper containers at 2½ cents per quart less than the home-delivered price. A small volume is sold in single quarts at 2 cents a quart less than the price charged for home deliveries. The store differential was introduced in March 1948 when out-of-area milk first came to the market.

In 1945 when these stores had the same price as that at homes, they sold an average of only about 25 quarts daily per store, or one-twentieth their present sales. Store sales in Champaign-Urbana then averaged 18 percent of all milk sold to consumers. By 1950 store sales had increased to 55 percent of total sales.

TABLE 2.—*Prices paid by consumers at stores and at homes, 1940, 1945, and 1949* [1]

[Cents per quart]

Market	1940		1945		1949	
	Home and store		Home	At stores	Home	At stores
Bloomington	10.0	10.0	12.5	12.5	20.0	18.0
Champaign-Urbana	11.0	11.0	14.0	14.0	20.0	18.0
Danville	9.0	9.0	12.5	12.5	20.0	18.0
Decatur	11.2	11.2	13.0	13.0	20.0	18.0
Peoria	12.3	12.3	15.0	15.0	20.0	18.0
Quad-Cities	11.0	11.0	14.0	14.0	19.5	17.5
Quincy	9.5	9.5	12.0	12.0	16.0	14.0
Springfield	12.0	12.0	15.0	15.0	20.0	18.0
8-city average	10.8	10.8	13.5	13.5	19.4	17.4

[1] These prices were for single quarts. Half gallons in some markets sold in stores for 2½ cents per quart less than the home delivered price for single quarts.

Increase in out-of-area shipments to the Champaign-Urbana market cause no loss in sales of local producers. In 1945 no outside shipments were received. By 1949 outside shipments to this market were about 17 percent of total shipments, and per capita sales were 23 percent higher than in 1945 (fig. 2). In fact, had per capita sales in Champaign-Urbana fallen from 1945 to 1949 as much as those in the United States, the price of milk to local producers would have been less than that received because of the higher proportion of their sales going to the low-priced classifications.

In 1950, per capita sales in Champaign-Urbana averaged 0.91 pint daily or 12 percent above those for 1949. This increase in milk sales was directly associated with the introduction in 1949 of the one-half gallon container at a price 2½ cents a quart below the home-delivered price.

Danville ranked first in per capita sales: In 1940, Danville had the same per capita sales of milk as New York City (0.74 pint).[8] New York was the highest

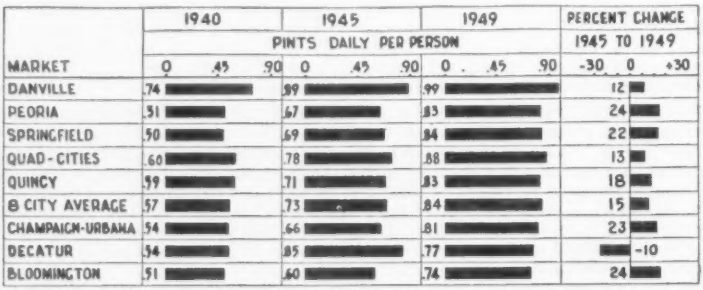

FIG. 2.—PER CAPITA SALES OF MILK IN EIGHT ILLINOIS MARKETS, 1940, 1945, AND 1949

for all eastern markets while Danville ranked first for the Illinois markets. High milk sales in Danville were directly associated with low prices charged for milk at milk depots in this market.

Between 1934 and 1939, the usual depot price for milk in Danville was 8 cents per quart or 4 quarts for 28 cents. Home-delivered milk was 10 cents per quart. Depot milk was highly publicized and people became aware of the price advantage. Many of them grew used to buying more milk and to buying it at depots.

In 1949, Danville again ranked first in milk sales in the Illinois cities for which data were available. This resulted in part at least, from the introduction of intermarket shipments. In 1948, a Chicago dealer made arrangements with a Danville dealer to sell grade A milk through stores and to homes in Danville. This milk, packaged in paper containers, sold in stores for 2 cents less than home-delivered milk. The city of Danville sued the Chicago dealer. The case was eventually settled out of court and intermarket shipments of milk to Danville continued. The publicity accompanying the suit increased the sales of milk.

USE OF GRADE A MILK INCREASES SALES

Following the cessation of World War II, many of the markets in central Illinois introduced a program of selling only grade A milk. This took place in many markets about the same time that intermarket shipments and store differentials were initiated. Hence, it is impossible to determine exactly the relative influence of these two forces.

CONSUMER INCOME ALSO A CAUSE FOR HIGHER SALES IN ILLINOIS MARKETS

Consumer income along with price and introduction of grade A milk has been a factor causing increased sales of milk in the eight Illinois markets. From 1940 to 1945, both consumer income and per capita sales rose in these markets and in the Nation (fig. 1). But, between 1945 and 1949, the picture changed.

[8] Illinois Farm Economics, October–November 1950, p. 1076.

Per capita sales in the Illinois markets continued to increase while those for the United States fell off sharply.

The drop in national sales can be explained by the increasing competition which milk markets faced with automobiles, houses, and other consumer products. This same competition, however, existed in the eight Illinois markets, yet sales of milk went up. Between 1945 and 1949, consumer income increased in both the eight markets and in the United States. The rate of increase, however, was somewhat greater for the Illinois markets than that for the country. In 1949, per capita consumer income in the United States was about 2½ times that of prewar while that of the Illinois markets had increased to 2¾ times that of prewar. Hence, the increase in per capita sales in Illinois markets, when those for the United States were declining, may be attributed, in part, to the greater increase in consumer incomes in the eight markets.

In 1950, per capita sales of milk in both the Illinois markets and the Nation were above those of 1949, those for Illinois having risen faster than for the United States. Consumer income increased in the United States, but decreased somewhat in the eight markets. The increase in Illinois sales in 1950 was associated with increased store sales, particularly those in one-half gallon containers, at reduced prices.

LONG-DISTANCE SHIPMENTS OF MILK AND CREAM INCREASE

During World War II, as well as in more recent years, milk shortages in many southern and eastern markets forced them to import milk from the surplus-producing areas of the Midwest. According to the report of the Northeastern Dairy Conference of August 1950: "The most serious shortages occurred in the New Orleans market where class I sales in 1946 equaled 114 percent of the milkshed supply, and the 1943–48 average was close to 10 percent. Large quantities of "emergency" whole milk and reconstituted milk were needed to make up the deficit in the milkshed supply. Milk shortages also were severe in Philadelphia, St. Louis, and Kansas City markets, and large quantities of emergency milk were required. Annual fluid-milk sales in these markets averaged about 90 percent of milkshed supplies during the 1943–48 period. Much lesser degrees of shortage were experienced * * * in the Boston market."[7]

In 1940, about 10 percent of the fluid cream receipts at the three markets of Boston, New York, and Philadelphia came from outside sources. The proportion increased to 51 percent in 1946 and declined to 16 percent in 1949. During 1950 and 1951 cream continued to be shipped regularly to Boston and other markets. Large volumes of milk were also sent from surplus-producing areas to shortage markets, particularly in the shortage months of 1951. Many southern markets have issued licenses to dealers in Chicago, Minnesota, and Wisconsin permitting them to sell milk and cream in these markets. From October to December 1951, Chicago dealers sold about 42 million pounds of grade A milk in bulk to markets outside of the Chicago milkshed.

Looking ahead, consideration may well be given to the following points:

1. Intermarket and long-distance shipments of milk should be encouraged as they increase the availability and per capita sales of this product.

2. Major attention should be centered upon breaking down trade barriers which now prevent the free flow of milk from some low-cost to high-cost producing areas, and upon preventing the initiation of new trade barriers.

3. Continued efforts should be made to make sure that only high-quality milk and cream are made available for intermarket and long-distance shipments.

R. W. BARTLETT.

Mr. ANDRESEN. The thought occurs to me that due to the fact that butter production has gone down about 800 million or 900 million pounds the farmer who ordinarily produces milk for butter purposes may be diverting that into fluid milk and going into these other markets where they can do better selling fluid milk.

Mr. BARTLETT. Of course, what you say is true, and would be particularly true in butter-producing States such as Minnesota, Wisconsin, and Iowa.

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[7] Dairy Production and Marketing in the Northeast, issued by the executive committee, Northeastern Dairy Conference, August 1950, p. 32.

In Illinois we have gone down from 71 percent of our milk sold as cream in 1909 to 41 percent in 1949. I am following your reasoning. Illinois milk is being diverted to market-milk purposes by this out-of-market shipment, but I do not think it has any relation to lower butter sales. In Chicago it comes down because we have paper containers, refrigeration, and good roads, and the fact that the retail prices and distributors' margins in many of these smaller markets have been too darned high. On the other hand, I would agree with you, that loss in butter sales has probably encouraged outer-market sales in Minnesota.

Mr. ANDRESEN. These sales were made at 2 cents a quart less outside of the milkshed. Was that a distribution through stores or was it to the homes?

Mr. BARTLETT. Primarily through stores. Store sales in the United States now amount to about 45 percent of all sales. I estimate that 10 years from now store sales will probably be about 60 percent. Store distribution of milk is one of the best ways to break down a local monopoly which exacts wide margins.

In Chicago 70 percent of all milk sold is through stores. In New York it is 70 percent, and about the same in Los Angeles and San Francisco. We have several large cities where they have had a large proportion of sales through stores for a long time.

Store sales are now gradually spreading to the smaller markets. I would like to make one more point with regard to the eight smaller markets in Illinois (exhibit III). From 1945 to 1949 the per capita sales in these eight markets, where we had the introduction of this out-of-market milk and lower prices, increased 15 percent, during the same period when per capita sales in the United States decreased 10 percent. To me that is a significant fact. That goes right along with the increased per capita sales in the Chicago market resulting from competition of store sales, the gallon jug, and the paper container. If we can get competition across the country we can sell a lot more milk. The places where they have vigorous competition are selling more milk.

Mr. GOLDEN. May I ask a question?

Mr. ANDRESEN. Mr. Golden.

Mr. GOLDEN. What do you think builds up these trade barriers you feel should be overcome? What builds those things up?

Mr. BARTLETT. Well, human nature. Every vested interest tries to get a monopoly. Historically you can read that as far back as there is written material.

Mr. GOLDEN. In other words, is it based on city ordinances?

Mr. BARTLETT. City ordinances, together with other monopolies, including the legalized monopoly of States fixing consumer prices (see footnote 2 of exhibit II), dealers' trade association monopolies, and the use of Federal milk orders to fix the class I price at a monopoly level. Any market which has no store differential or only a 1-cent differential, is probably under some type of monopoly control. I would say that three-fourths of the cities and villages in the United States have trade association or legalized monopolies today. The store price in these places is either the same or not more than 1 cent below the home-delivered price. We have 12 States which still have consumer price fixing. To me consumer price fixing is a very per-

nicious thing, since its basic purpose is to freeze dealers' handling margins at a high level, and keep dealers free from price competition. We had 25 States that had consumer price fixing, and 13 of them threw it out. I am looking to the day when the other 12 will eliminate this type of control, which is definitely against public interest.

To take a local example, the State control commission in Virginia allow stores in Virginia only a 1-cent store differential. Consumers in Washington, D. C., can buy milk at 3 cents a quart less at stores than on home-delivered routes and frequently the differential has been 3½ cents a quart. Consumer price fixing in Virginia constitutes a trade barrier which is definitely against public interest, and is also against interests of farmers generally since exaction of monopoly store prices tends to lower per capita sales of milk. (See exhibits II and III, pp. 434 and 441.)

Mr. GOLDEN. Do they operate with the idea of fixing certain standards which the group can comply with, which the producers outside cannot comply with?

Mr. BARTLETT. Yes, that is one of the techniques. Of course, it will depend upon the group you are talking about at a particular time.

For example, milk from Washington, D. C., is sold regularly to stores in Richmond, Va. Virginia will not permit milk received from Washington producers to be sold in Richmond. Rather it must be milk originating from producers in the Richmond milkshed. This constitutes a type of trade barrier which is found in most States having consumer price fixing as well as in many States that do not have this type of legalized monopoly. It is a pernicious type of control which, according to the recent report of the National Research Council, has little, if any, validity when based upon scientific analysis of the factors which influence the quality of milk.

Now, we are getting this outermarket distribution, which is bringing down some of these barriers little by little; but there is a tremendous effort to prevent that.

Let us get down to a case where one can see the thing more clearly. When the vendor of the Dean Milk Co. came into Champaign-Urbana there was hell to pay. The local dealers did not like to have the outside milk coming in. They did everything in their power to prevent them from selling milk. He came in there and sold Chicago grade A milk at 2 cents a quart cheaper, and the customers did not object. The dealers did not stop him and he became a recognized factor in the market. Today this vendor daily is shipping about 17,000 quarts of milk from Chicago that come to Champaign-Urbana from the Dean Milk Co., and is being distributed within a radius of 50 miles of Champaign-Urbana.

This resistance to outside competition is the type of trade association monopoly I referred to, when three or four distributors try to stop the decrease in margins from outside competition. I think that probably this same thing exists pretty much across the country.

I have testified in Portland, Oreg., and Philadelphia and Allentown, Pa., and so forth, and in practically every place you run up against the same thing. In April 1953 I was in Vancouver, British Columbia, and appeared on this same problem. There, as in this country, they have tried to prevent the margin from being squeezed down.

Mr. GOLDEN. From your study of this very difficult problem, have you concluded that these trade barriers are injurious to the producers and also injurious to the consuming public?

Mr. BARTLETT. Yes; very much so.

Mr. ANDRESEN. Have you studied the situation in the District of Columbia?

Mr. BARTLETT. I have read some of the newspaper reports. I think getting down to specifics that probably the class I price in this market has been too high in recent years, higher than it would be under competition. I think that is one thing that has to be broken. Particularly along the eastern seaboard is where we have class I prices that have been very much out of line. I have some references specifically to the New York market, which I am going to bring in as evidence in just a few minutes.

I wanted to clear up the point with regard to the per capita sales under this point. The introduction of store prices in these markets, these eight downstate Illinois markets and Chicago, has resulted in an increase in per capita sales when per capita sales were declining in the United States generally.

Mr. ANDRESEN. Of course, in the District of Columbia they have what they call a closed shop, with no milk marketing order.

Mr. BARTLETT. Yes.

Mr. ANDRESEN. It is very difficult to get milk into this area, unless there is an inspection of the dairy and the quality of the milk, and all of that, before it comes in.

Mr. BARTLETT. Yes. This is a situation similar to that in Virginia and numerous other markets.

Mr. ANDRESEN. Even though they do inspect it they can still stop it from coming in.

Mr. BARTLETT. That thing is very pernicious, and eventually it will be broken down. One may logically raise the question: Why should milk be the only agricultural commodity which has a trade barrier in the District of Columbia?

Mr. ABERNETHY. Will the chairman yield?

Mr. ANDRESEN. Yes.

Mr. ABERNETHY. Does that system prevail in other cities of the country?

Mr. BARTLETT. Yes, sir; in many other cities.

Mr. ABERNETHY. As the chairman has described, this closed shop is effected through the means of local inspection.

Mr. BARTLETT. That is one technique which is used to create the barrier.

Maybe at this point I could put something in specifically concerning the New York market, which will bear directly on this point, and then we can go on from that.

Mr. ABERNETHY. Let me ask you a question right there.

Mr. BARTLETT. All right.

Mr. ABERNETHY. You testified particularly as to the city of Chicago. Do they have the same system there?

Mr. BARTLETT. Chicago is located in the heart of a surplus producing area of the United States. Wisconsin produces about 15 or 16 billion pounds of milk. Chicago does not limit the supply. They permit any producers to come in, anyone who meets the grade A requirements, to come on the market.

Mr. ABERNETHY. There is no inspection by the city health department?

Mr. BARTLETT. Every grade A producer in the city of Chicago has to have a grade A permit; 23,000 producers have 23,000 permits.

Mr. ABERNETHY. They will go out to inspect the dairies?

Mr. BARTLETT. They will go out to inspect the dairies. Any producer who meets the grade A requirements can get on the market.

Mr. ANDRESEN. He must be inspected first?

Mr. BARTLETT. Before he can get on the market he has to have a permit. Also, every dealer has to have a grade A permit.

Mr. ANDRESEN. As long as we are on that subject, let me ask you a question.

Mr. BARTLETT. Go ahead.

Mr. ANDRESEN. Your local authorities in Chicago have set up these specifications for milk?

Mr. BARTLETT. That is right, but it is based upon the so-called United States standard milk ordinance.

Mr. ANDRESEN. The same is true in the District of Columbia and all over the country. What do you have to propose in lieu of local inspection, thinking about having something which is a national standard on the quality of milk?

Mr. BARTLETT. That is a good question, Mr. Andresen. I am not a dairy technologist, but I am an economist. If I were going to work on this problem from the viewpoint of a national basis I would certainly look into the report of this National Research Council which came out recently, in which they made a very detailed study of this question in, I believe, eight markets. They include Birmingham, Boston, and Sacramento, I think there were eight markets where they made a very detailed study.

They came out with specific recommendations as to what requirements are necessary and those which are not necessary. I certainly would use that as a foundation to my approach to this problem. That just came out within 2 or 3 months.

Mr. ANDRESEN. Do you know if that document is available?

Mr. BARTLETT. That document is available. It is a printed form.

Mr. ANDRESEN. Mr. Wilcox says he has a copy of it.

Mr. BARTLETT. I would say, just to get at the principle of the thing, that the essence of that report is this: Many of these farm requirements of inspection are not necessary. Platform inspection of quality, including sediment, flavor, bacteria count and so forth, is desirable. Many of the farm inspections are just superfluous and have no connection whatsoever with quality. It is on the basis of these technicalities that many municipalities have tended to keep producers out.

Mr. ANDRESEN. Do you think that the Public Health Service could set up a uniform national standard for milk to supplant these local regulations?

Mr. BARTLETT. I think maybe we have arrived at a point when we should give serious consideration to that. Hundreds of municipal ordinances have given local groups far too much authority. Possibly a Federal act could segregate requirements that are necessary from those which are not, and permit a continuation of enforcement of necessary requirements by local municipalities. Possibly all we need to break down inspection barriers is one or two more decisions by the

United States Supreme Court similar to that in the *Dean Co.* v. *Madison* (January 1951).

May I introduce my discussion dealing with this specifically? I have some material dealing with this for New York.

Mr. ANDRESEN. Yes, sir.

Mr. BARTLETT. Another point covered under No. 3 of exhibit I is the possible expansion of milk sales by the use of vending machines.

May I include an article entitled, "Milk Vending Machines" from Illinois Farm Economics of November-December 1951, pages 1249 to 1255, as exhibit III–A.

(The information is as follows:)

EXHIBIT III–A

[Illinois Farm Economics, November–December 1951]

MILK VENDING MACHINES

Merchandising milk through vending machines in factories, service companies, offices, and schools presents a profitable sales outlet for dairy companies. Some have already purchased machines. Others are interested in learning what machines to buy, where to place them advantageously, and how to service them. In the interests of future owners, 10 Illinois dairy companies owning and operating machines were interviewed during the months of June, July, and August 1951.

The field was found open both to the small and the large dairies. One dairy was operating a single machine; another had 90 machines. The average was 22 per dairy.

The machines were alike in being designed to dispense only packaged milk. They differed in operation. One hundred and nineteen were automatic, requiring only the insertion of a coin; the others, 103, were of the manual type with a lever or small door.

Manual machines are relatively inexpensive ($200 to $500 depending upon the brand and the size). Mechanically simple, their maintenance cost is low. They are slow, but when placed in service companies[1] or department stores where speed of service is not important, they have proved to be dependable and economical.

Automatic machines of the same capacity are twice as expensive as manual machines, but they serve many customers in a short time. A dairy owner is justified in investing in an automatic machine if he can place it where there will be sufficient sales. In a factory, for example, when the midmorning and the midafternoon "breaks" free crowds of thirsty workers, automatic machines can serve approximately five times as many customers in a given time as manual machines.

TABLE 1.—*Number of machines per dairy*

Dairy No.:	*Number of machines*[1]	Dairy No.—Continued	*Number of machines*[1]
1	90	7	8
2	35	8	6
3	30	9	4
4	20	10	1
5	20		
6	8	Total	222

[1] Dairy No. 8 was operating only 5 of its 6 machines.

Capacity of vending machines: The machines differed in capacity, most of those studied ranging from 84 to 140 units. The capacity by size of container is shown in table 2. Dairy owners reported that they found it most economical to operate machines with capacity slightly in excess of their maximum daily sales. When forced to use smaller machines, they either serviced them more often or installed auxiliary machines.

[1] Companies where repair service is available, that is, garages and public utility companies.

Maintenance: Any operator expects that his vending machines, no matter how well constructed and cared for, will break down occasionally. He may find that he has to watch the coin mechanism for signs of trouble. The bottle dispensing unit is also subject to breakdown, and experienced operators say it is wise to keep on hand the small pins and springs needed for repairing it.

Most manufacturers are very ready to service the machines they sell. If they are located at a distance, however, they cannot give immediate service. Consequently, many dairies have preferred to buy machines locally manufactured.

Dairy managers operating many machines said that they had employees especially trained by their vendor manufacturing company to keep their machines in running order. These men were usually either refrigeration repairmen or general repairmen. Since they understood the mechanism of the vending machines and knew where to look for wear, they often replaced parts before any breakdown actually occurred. When they were not able to forestall trouble, they repaired machines rapidly and prevented their being kept out of service.

Small dairies have at least one employee who is mechanically inclined. He can be trained to make small repairs.

TABLE 2.—*Capacity of vending machines*

Size of container	Range in number of units in operating mechanism	Additional storage capacity of machine
		Units
Paper:		
½ pints	84-140	250
⅓ quarts	84-140	200
Pints	84-140	150
Glass:		
½ pints	84-128	100
⅓ quarts	62-107	75
Pints	56-100	62

Form and size of the unit sold: Operators serviced their machines with either glass or paper containers according to the custom of their dairy. Paper was preferred. The size of the unit varied: one-half pint, one-third quart, and 1 pint. The one-third quart was the most popular unit. Seven-eighths of all the machines studied dispensed this size (table 3).

Price per unit: All dairies agreed in charging 10 cents for a one-third quart container and 15 cents for a pint. Two companies owned machines which dispensed one-half pints at 7 cents per unit.

When vending machine prices are in multiples of 5 cents, the coin mechanisms are comparatively simple and the machines less likely to get out of order.

Location requirements: When placing machines, dairy companies considered the type of activity in the location, the employee income level, the accessibility of the machines, the number of "break" periods in factories and offices, and the sex of the workers. If the industry was seasonal, they also inquired when the customer potential was high and when low.

TABLE 3.—*Number of machines by size of container*

Size of unit:	*Number of machines*
½ pint	20
⅓ quart	194
Pint	8
Total	222

This study showed that dairy companies prefer factory locations. Of 222 machines, 175 or about four-fifths were in factories (table 4). Most companies, before deciding to install a machine, looked for a factory with at least 100 employees. A few insisted on 300. In choosing where to place the machines within the factory, the vending operator generally sought the cooperation of the management representative. Together they looked for a sanitary, attractive spot, accessible to a large number of patrons and yet so located as not to obstruct the flow of traffic.

Experienced operators say that a good general rule is that any place attracting people is worth investigating as a possible site for a machine.

Percentage-paid location: Most dairy companies worked through the factory unions when wishing to install machines. Although they talked up the health angle, they also offered the union commission on gross receipts, usually 10 percent. This arrangement sometimes swelled the union athletic or flower fund by as much as $75 or $90 per month, but it also helped the dairy by preventing rival companies from installing machines and by insuring regular patronage.

Regular servicing needed: The greater number of machines in this study were service by wholesale route men. A few of the smaller dairies, however, used retail route men.

In all cases, the purpose of servicing was to insure a supply of fresh milk for the customers. This meant that the machines had to be serviced once or twice a day. In some machines, the method of refilling was such that the old milk was automatically sold first. In others the delivery man had to move the old milk into a new position. When the machines contained storage space, the employee in charge of the machine had a key and could refill the machine from the reserve.

Although the time required for servicing was usually not more than 15 to 20 minutes each day, additional time was needed for keeping the machines sanitary. At least once, sometimes twice, during the week, servicemen cleaned both the outside and the inside of the machines. They found that one of the best ways to keep the machines fresh was to wash them with a solution containing a drop of wintergreen.

A dairy operator is wise to consult the local health authorities before purchasing and installing vending machines. He will find that many health departments prohibit certain types of machines such as bulk vendors.

Since vending machines serve a permanent and special group of patrons, the milk sold should be of the highest quality.

TABLE 4.—*Location of machines in study*

Location:	*Number of machines*
Factories	175
Department stores	15
Service companies	15
Gas stations	10
Schools	2
Other	5
Total	222

Kind of milk sold: Most dairies in this study used only chocolate and white milk in their machines. The ratio of two-thirds chocolate to one-third white was the same as that reported in other studies on vending machines.[2] In addition a few dairies sold buttermilk or orange drink.

The purchaser of a vending machine should consider the tastes of his customers and remember that they may demand more than one kind of milk. Some machines can dispense only 1 product; other are capable of selling as many as 8. Those which offer a selection may be geared to sell all items at one price or at varying prices.

If too many items of limited popularity are offered, the operator may find that some of them remain unsold and clutter the machine. Another difficulty pointed out by Ramstad and Holland is that the time people required in making a decision when confronted with a variety to choose from may prevent others from patronizing the machine.[3]

Minimum volume necessary to meet expenses: Although it is impossible to determine exactly the number of sales an automatic machine must make daily to meet all expenses, a fairly accurate estimate is 70 units (table 5). Since both the initial cost and the servicing of such a machine run high, anyone investing should know approximately what daily volume he can expect for each machine. He will amortize his machine, perhaps over a period of 4 years, at the end of which time it may or may not be obsolete. His labor bills are even higher than the cost of his machine. Ramstad and Holland in their study conclude that,

[2] A. E. Yahalem, Plus Profits in Milk Vending, American Milk Review, April 1951.
[3] R. F. Holland and P. E. Ramstad, Selecting Vending Machines, American Milk Review, July 1951.

"during the lifetime of a vending machine labor coses equal to several times the original cost of the equipment may be expended in servicing, maintaining, and cleaning it." [4]

TABLE 5.—*Comparative returns from milk dispensed through vending machines and milk sold wholesale by dairies*

	Vending machine	Wholesale
Units sold per day	[1] 70	[1] 70
Price per third quart	$0.10	[2] $0.06
Gross returns per day	$7	$4.20
Approximate number of working days per year	255	255
Total returns per year	$1,785	$1,071

[1] Dealers using automatic machines estimated this volume necessary to meet expenses.
[2] Estimated price charged by dealers for milk sold to restaurants, hotels, and other.

TABLE 6.—*Average daily volume of 25 machines owned by 2 companies*

Volume:	*Number of machines*
0–100	6
101–200	9
201–300	6
301–over	4

If one assumes a volume of 70 units daily, the gross return per year to a dairy plant from a vending machine is $1,785. The gross return from the same volume of milk sold wholesale from a plant would be $1,071 (table 5). The difference is $714. After subtracting an estimated depreciation charge of $200, the operator has approximately $500 for servicing, maintaining, and cleaning the machine. Some operators will need this sum to cover running expenses. Others who are especially efficient will show a profit on a volume of 70 units per day.

In this study complete data on 25 machines owned and operated by 2 dairies were collected (table 6). All machines were located in factories employing over 300 people; 6 machines dispensed 100 units per day or less; 4 dispensed over 300. Assuming a midpoint in range, the average daily volume of all these machines was 180 units per day. In view of their own estimated break even of 70 units per day, it is apparent that these companies were finding the majority of their 25 machines very profitable. It is estimated that the average daily volume of the 222 machines was 120 units per day, or considerably over the break-even point.

The daily volume of the machine dispensing the largest number of units for each of 10 companies ranged from less than 100 to over 300 (table 7).

TABLE 7.—*Average daily volume of highest volume machine owned by each of 10 companies*

Volume per day:	*Number of machines*
0–100	2
101–200	4
201–300	1
301–over	3

Summary: Before World War II many dairies purchased milk-vending machines hoping for the quick and easy profits they saw made from machines dispensing products other than milk. Their ventures often failed, not because the idea behind milk vending was an impractical one, but because their equipment was poor, their operating methods inefficient, and their knowledge of the business inadequate.

During the war, however, when Government authorities placed emphasis on the dietary value of milk, both dairy and vendor manufacturing companies felt a renewed interest in milk vending. The manufacturers put out better machines and the dairy companies installed them in factories and munition plants, especially in those where fumes from smoke made it necessary that milk be available to combat ill effects to health from these hazards.

[4] Ibid., p. 36.

Careful investigation has shown that large volume sales may be made through vending machines, and that these sales may be profitable. Any interested dairy, large or small, may do well to invest in one or more machines providing the management chooses the right machines, locates them with care, and sees that they are well serviced.

Vending machines benefit the public as well as the companies owning them. They tend to increase milk sales and improve the health of the people.

G. C. KLEIMAN and R. W. BARTLETT.

Mr. BARTLETT. At this time I would like to submit for an exhibit the material on Principles and Practices of Pricing Market Milk. (Exhibit IV.)

I have included in here a discussion of the law of comparative advantage, the essence of which is that milk should be produced in the areas where the costs of getting it produced plus the transport costs are the lowest.

This also includes the priniciples of classified pricing of milk based upon its utilization in different products; the practice of classified pricing of milk in Wisconsin; the essence of that is that milk historically has been priced on a classified basis with market milk priced highest, evaporated milk next, cheese the next and butter the lowest.

The fourth discussion is the application of classified pricing of milk to the Federal order program. Under this I would like to include as exhibit V, pages 739 to 743, of Illinois Farm Economics, October 1948. Fifth is the abuse of classified pricing under a Federal order. That gets into directly the point we are discussing now, and also gets into the question of the use of the Federal order as a trade barrier and the use of health department requirements as a trade barrier, both of which I have evidence on concerning New York City.

(The information is as follows:)

EXHIBIT IV

PRINCIPLES AND PRACTICES OF PRICING MARKET MILK

R. W. Bartlett[1]

I. THE LAW OF COMPARATIVE ADVANTAGE AS APPLIED TO MARKET MILK AND CREAM[2]

1. Both milk and cream for any market should be produced in areas where costs of getting milk produced plus transport costs are the lowest. If Minnesota farmers can produce high-quality milk and transport it to Florida or Texas cheaper than it can be produced in these States, it should be produced in Minnesota. From a public viewpoint, consumers are interested in getting high-quality products at reasonable prices. Furthermore, an underlying basis for the high standards of living in the United States has been the application of the "law of comparative advantage," wherein goods are produced in low-cost areas. Michigan and New York produce large quantities of apples, but no oranges; most of our oranges are produced in California and Florida, where the natural advantage of climate results in low-cost orange production.

The Corn Belt States produce the bulk of concentrated feedstuffs used in both the Midwestern and Eastern States. For years my father bought rations for feeding dairy cattle on his Vermont farm which were mixed in Buffalo, but most of the ingredients originated in the Midwest areas. His Vermont farm could economically produce enough pasture and hay, but it was cheaper for him to buy most of his concentrates than to produce them. Milk producers located

[1] Professor, department of agricultural economics, College of Agriculture, University of Illinois, Urbana, Ill.

[2] From Principles for Pricing Market Milk (Bartlett), Illinois Farm Economics, October 1948, pp. 740–741.

in eastern milksheds have a natural advantage of location as compared with milk producers located in the surplus-producing areas of the Midwest. There are, however, definite limits to this natural advantage, particularly in the sale of cream.

Cream can be shipped long distances at relatively low costs. Costs for hauling cream are about one-tenth of those for hauling market milk. Much cream is still being separated from market milk in several eastern markets. In New York City, for example, a major part of the cream used is obtained from milk produced in the New York milkshed. As a long-time program, it is good economics for eastern markets to use as market milk as large a proportion of its total production as possible and to make up shortages with shipments of cream from the surplus producing areas of the Midwest. In some markets this will necessitate shifting of some producers from one milkshed to another or working out some method for intermarket shipments of milk.

II. PRINCIPLES OF CLASSIFIED PRICING OF MILK BASED UPON ITS UTILIZATION IN DIFFERENT PRODUCTS

R. W. Bartlett [3]

Milk in different uses has different values. Some people not familiar with the facts underlying these differences sometimes raise the question: Why should milk used in one form have a higher value than that utilized in another form? Principles underlying classified pricing of milk and their application in practice are discussed below.

I. *Market milk and evaporated milk.*—Costs of getting enough market milk produced to meet the demand are higher than costs of getting condensery milk produced because of differences in storability, transportation costs, and quality requirements.

A. Since people drink market milk every day of the year and as it is highly perishable, a supply must be produced every day to meet the demand. Since it costs more to get milk produced in the winter months than in spring or summer months, the annual price of market milk must be higher than for milk going to condenseries [4] in order to pay for the additional costs.

B. Since market milk is bulky and is highly perishable, unit costs of transportation are higher than those for canned milk from which over half the water has been removed and which can be transported without refrigeration. For long distances, unit costs of transportation for whole milk are over three times those of evaporated milk (table 1), and exactly three times those of fresh concentrated milk, which must be kept refrigerated.

C. Since market milk is highly perishable and not sterile, most city markets have enacted ordinances which include sanitary requirements not in force for evaporated or condensed milk. This is another factor which increases the unit cost for getting market milk produced.

II. Evaporated milk and cheese and butter.—Since evaporated and condensed milk use the total solids in milk and since their production requires high capital expenditures, unit costs of getting a supply of milk sufficient to operate economically usually are higher than for milk manufactured into cheese or butter.

III. Cheese and butter.—Since cheese uses a greater proportion of total milk solids than butter, and since milk manufactured into butter competes with cream which can be transported economically for long distances, unit costs of getting milk supplies for cheese factories usually are higher than those for milk manufactured into butter.

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[3] Professor, department of agricultural economics, College of Agriculture, University of Illinois, Urbana, Ill.

[4] Normally the June production of canned evaporated milk is about 2½ times that of November.

TABLE 1.—*Costs for transporting whole milk, evaporated milk, and fresh concentrated milk from milk plants near Chicago to specific markets, 1951* [1]

Market	Whole milk	Evaporated milk	Whole milk	Evaporated milk [1]	Fresh concentrated milk [2]
	Per 100 pounds: actual		Per 100 pounds of milk or milk equivalent		
Baltimore	$1.51	$0.95	$1.51	$0.432	$0.502
Boston	1.58	1.04	1.58	.471	.525
Buffalo	1.12	.77	1.12	.350	.372
Houston	2.25	1.36	2.25	.617	.749
Jacksonville	1.91	1.28	1.91	.582	.637
New Orleans	1.65	1.14	1.65	.517	.549
New York	1.63	1.04	1.63	.474	.544
Philadelphia	1.49	.99	1.49	.449	.498
Pittsburgh	1.09	.76	1.09	.344	.363
Providence	1.58	1.04	1.58	.471	.525
Rochester	1.21	.88	1.21	.399	.405
Average	1.547	1.023	1.547	.464	.515

[1] Whole and concentrated milk data obtained through the courtesy of George L. Bowen, terminal manager, Refrigerated Transport, Inc., Chicago. Based upon minimum load of 20,000 pounds including 18,000 pounds of milk and 2,000 pounds tare.

Evaporated milk data obtained through the courtesy of a manufacturer shipping milk in carlots from an Illinois condensery in the Chicago milkshed. Evaporated milk based upon 2.2 to 1 concentration.

[2] Based upon a 3 to 1 concentration.

III. PRACTICE OF CLASSIFIED PRICING OF MILK BASED UPON ITS UTILIZATION IN DIFFERENT PRODUCTS IN WISCONSIN

Probably nowhere in the United States are the principles of classified pricing of milk better illustrated in practice than in Wisconsin, since milk prices in all uses in this State have been relatively free from monopolistic controls.

Milk prices paid to producers in Wisconsin have been different for milk utilized in the different dairy products as far back as records have been available.

Thus, from 1910 to 1051 the price per 100 pounds of 3.5 percent milk in Wisconsin averaged $2.18 for market milk, $2.01 at condenseries, $1.91 at cheese factories, and $1.81 at creameries in Wisconsin (table 2). Price differences for more recent periods are also shown in table 2.

TABLE 2.—*Average milk prices in Wisconsin, 1910–51*

Years	Price per 100 pounds 3.5 percent milk			
	Market milk	Condenseries	Cheese factories	Butter factories
1910–51	$2.18	$2.01	$1.91	$1.81
1922–51	2.29	2.07	1.97	1.92
1932–51	2.43	2.17	2.09	2.03
1942–51	3.32	3.04	2.96	2.90

Source: Compiled from data received from Walter H. Ebling, statistician, Wisconsin State Department of Agriculture; 1910–48 from Wisconsin State Agriculture Bulletin 249. Data for 1949–51 included in a letter from Walter H. Ebling. All prices as reported were adjusted to a basis of 3.5 percent butterfat.

The fact will be noted that the relative values of market milk have been increasing in recent years while relatives values of milk at condenseries and cheese factories have been decreasing. Thus, from 1910 to 1951 market milk averaged 17 cents more than condensery milk, 27 cents more than milk used for cheese, and 37 cents more per 100 pounds than milk sold to creameries.

From 1942 to 1951 market milk averaged 28 cents more than condensery milk, 36 cents more than milk used for cheese, and 42 cents per 100 pounds more than milk sold to creameries.

For the past 25 years Wisconsin has been the largest dairy State. Prices paid to producers in this State have been highly competitive because of the relative ease of shifting the outlets to which milk is sold, and because 70 percent of the milk is manufactured and must compete in price on a countrywide market.[5]

IV. APPLICATION OF CLASSIFIED PRICING OF MILK TO THE FEDERAL ORDER PROGRAM [6]

"2. The price for market milk (class I) should be established in a Federal order so that it automatically goes up or down in line with some dynamic factor, such as prices of manufactured dairy products.

"3. The price for market milk (class I) should be established at premiums above prices of manufactured dairy products sufficiently high to get a blend price which will encourage enough but not too much milk to meet market needs. Bottom prices of manufactured dairy products should be kept as high as practical to prevent class I prices being too high, and to prevent dealers who handle a large volume of surplus milk from having an unfair advantage over dealers whose purchases are largely for class I sales.

"4. Since it is uneconomical to produce large quantities of grade A or other high-priced milk to be manufactured into lower-priced surplus products, premiums paid for class I milk above prices for manufactured dairy products—

"(*a*) Should be larger in months of low production and smaller in months of high production to encourage an annual production more nearly in line with a market's need for milk, and

"(*b*) Should be raised on an annual basis if there is too little milk to meet whole-milk requirements, and lowered if the blend price results in too much milk in the shortage months to meet whole-milk requirements."

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[5] Changes in prices paid producers for milk in Wisconsin have been closely associated with changes in the general level of farm prices in the United States. Between 1920 and 1950, the coefficients of correlation between these price series were as follows: United States farm price and market milk, r=0.968; United States farm price and milk at condenseries, r=0.967; United States farm price and milk at cheese factories, r=0.969; United States farm price and milk at creameries, r=0.971.

[6] From Illinois Farm Economics, October 1948, pp. 741–745.

TABLE 3.—*Per capita consumption of dairy products, United States, 1909–52* [1]

Year	Total milk	Fluid milk and cream	Butter	Cheese	Evaporated milk	Condensed milk	Dry whole milk	Dry skim-milk	Ice cream
1909	763	351	17.6	3.9	1.4	4.0	(2)	(2)	0.3
1910	752	323	18.2	4.3	1.5	4.3	0.01	(2)	.4
1911	743	309	18.5	4.1	1.7	4.7	.01	(2)	.5
1912	757	363	16.4	4.0	1.9	5.1	.02	(2)	.6
1913	748	350	16.3	4.4	2.4	5.5	.03	(2)	.6
1914	740	329	16.8	4.4	2.9	6.0	.06	(2)	.7
1915	745	326	17.1	4.3	3.3	6.2	.04	(2)	.9
1916	741	323	17.1	4.0	3.6	6.0	.04	(2)	1.0
1917	723	336	15.6	3.9	3.8	5.6	.04	(2)	1.1
1918	719	369	13.7	3.8	4.8	5.4	.04	(2)	1.3
1919	727	343	15.1	4.2	6.3	3.5	.08	(2)	1.4
1920	729	356	14.7	4.1	7.1	1.4	.07	0.2	1.5
1921	761	354	16.1	4.1	7.7	2.1	(3)	.2	1.5
1922	775	350	17.0	4.3	8.2	2.6	.02	.2	1.6
1923	780	336	17.7	4.3	8.9	2.5	.06	.4	1.7
1924	787	347	17.8	4.5	9.5	2.2	.05	.4	1.7
1925	792	347	17.9	4.6	9.1	2.5	.07	.4	2.0
1926	807	347	18.4	4.6	9.5	2.2	.09	.5	1.9
1927	703	347	18.0	4.4	9.4	2.2	.10	.7	2.0
1928	796	348	17.4	4.4	10.1	1.9	.08	.8	2.0
1929	803	351	17.2	4.6	11.1	2.4	.10	1.1	2.1
1930	813	350	17.2	4.6	11.2	2.3	.09	1.3	1.9
1931	833	347	18.0	4.4	11.4	1.9	.04	1.4	1.7
1932	830	351	18.1	4.3	12.3	1.6	.07	1.4	1.2
1933	813	349	17.8	4.5	12.3	1.4	.09	1.4	1.2
1934	812	333	18.2	4.8	13.4	1.5	.12	1.5	1.4
1935	799	336	17.1	5.2	14.6	1.5	.13	1.6	1.6
1936	792	341	16.4	5.3	14.0	1.8	.14	1.8	1.9
1937	796	341	16.4	5.5	14.9	1.7	.11	1.9	2.2
1938	796	339	16.4	5.8	15.5	1.6	.11	2.1	2.1
1939	824	343	17.3	5.9	16.2	1.5	.13	2.2	2.3
1940	821	343	16.9	6.0	17.4	1.8	.14	2.2	2.4
1941	808	352	16.0	5.9	16.7	1.7	.16	2.5	2.9
1942	839	371	15.8	6.4	16.3	1.9	.20	2.5	3.4
1943	762	394	11.8	4.9	17.1	1.7	.39	2.1	2.6
1944	775	411	11.9	4.8	13.7	1.9	.34	1.5	2.8
1945	804	432	10.9	6.6	16.2	2.0	.37	1.9	3.0
1946	813	423	10.5	6.7	17.0	1.5	.51	3.2	5.2
1947	787	398	11.1	6.9	18.1	2.2	.45	2.9	4.5
1948	751	387	9.9	6.9	18.3	1.8	.29	3.3	4.0
1949	701	384	10.4	7.2	17.7	1.9	.25	3.3	3.8
1950	776	385	10.7	7.7	18.0	2.0	.28	3.6	3.7
1951	759	395	9.6	7.2	16.2	2.0	.27	4.2	3.7
1952	743	400	8.7	7.5	16.0	1.9	.34	4.2	3.8
Total	34,298	15,710	681.7	224.2	478.7	119.4	6.03	58.9	90.1
Average	779.5	357.0	15.493	5.095	10.88	2.714	.1436	1.78	2.048

[1] 1909–44 Milk Production on Farms and Statistics of Dairy Plant Products, 1950, Bureau of Agricultural Economics, U. S. Department of Agriculture, Feb. 15, 1951. 1945–52 data from U. S. Department of Agriculture, Bureau of Agricultural Economics, data for 1951 were preliminary; those for 1952 partly forecast.
[2] Not available.
[3] Less than 0.005.

EXHIBIT V

[Illinois Farm Economics, October 1948]

PRINCIPLES FOR PRICING MARKET MILK [1]

The principal objective of a university is to assemble, discover, and disseminate truths which will be most useful in improving the standards of living of the people whom it serves. Hence, in setting down principles for pricing of market milk, the first question which a university researcher may logically raise is: Is the proposed pricing policy in line with public interest? Does it tend to encourage the maintenance and expansion of sales of market milk in line with nutritional needs? Does it tend to promote harmony between producers and dealers and to put a stop to milk strikes which in the past have been costly to all groups?

A second question: Is the proposed pricing policy fair to the various interests involved? Is it fair to farmers? Is it fair to dealers? Is it fair to labor?

[1] Paper presented at the conference of Federal Milk Market Administrators, Commodore Hotel, New York City, May 20, 1948.

A third question: Is the proposed prising policy workable? A large number of proposals for policy changes are impractical because for one reason or another they would not be accepted by the groups affected. Eventual acceptance by both producers and dealers is essential to the practical operation of any milk pricing policy.

Before setting down specific principles dealing with the pricing of market milk, let us review certain facts which directly or indirectly are pertinent to this problem:

1. Of the 120 billion pounds of milk produced annually in the United States, about 50 percent is used for market milk and cream while the other 50 percent is manufactured.

2. Per capita consumption of milk (and cream) increased from 160 quarts annually in 1940 to 201 quarts in 1945, and then decreased to 185 quarts per person in 1947, according to the United States Department of Agriculture. The present consumption of milk is still too low in relation to nutritional needs, particularly for low-income people. The 25-quart net increase in milk used is being consumed by many people who are price sensitive and will be quick to reduce milk purchases with a decline in nonagricultural income unless at the same time retail milk prices are reduced materially.

3. Careful studies have shown that people drink more milk when it is cheap than when it is expensive. We are about to release a study in our next issue of Illinois Farm Economics which analyzes the effect that prices and consumer income have had upon per capita sales of milk in the United States from 1930 to 1947. This also includes a summary of Blanford's study of 4,508 stores in New York City in 1938 and Lee's study of per capita milk consumption of some 1,300 consumers in Champaign-Urbana for 1933–38.

4. Milk used in whole form usually returns more dollars per unit than manufactured milk. Hence, it is to the enlightened self-interest of dairy farmers of America to maintain sales of market milk at a high level.

5. The acceptance of Federal milk orders by both dealers and farmers, particularly during the past 8 years, has been due in large part to the high degree of flexibility in keeping the price of class I market milk in line with prices of milk in other uses, and with prices of competing farm products.

6. If history repeats itself, all farm prices, including milk prices, will fall within the next few years.

7. Shipments of milk during World War II proved conclusively that, if properly handled, high-quality milk can be set down in good condition in markets located long distances from where the milk was produced. The question of intermarket shipments is thus not a question of quality, but a question of how the price in any particular area compares with price plus transport costs from some other area.

Keeping in mind the above facts, the following principles are suggested as a basis for determining the price of market milk used in whole form:

1. Both milk and cream for any market should be produced in areas where costs of getting milk produced plus transport costs are the lowest. If Minnesota farmers can produce high-quality milk and transport it to Florida or Texas cheaper than it can be produced in these States, it should be produced in Minnesota. From a public viewpoint, consumers are interested in getting high-quality products at reasonable prices. Furthermore, an underlying basis for the high standards of living in the United States has been the application of the "law of comparative advantage," wherein goods are produced in low-cost areas. Michigan and New York produce large quantities of apples, but no oranges; most of our oranges are produced in California and Florida, where the natural advantage of climate results in low-cost orange production.

The Corn Belt States produce the bulk of concentrated feedstuffs used in both the Midwestern and Eastern States. For many years my father bought rations for feeding dairy cattle on his Vermont farm which were mixed in Buffalo, but most of the ingredients originated in the Midwest areas. His Vermont farm could economically produce enough pasture and hay, but it was cheaper for him to buy most of his concentrates than to produce them. Milk producers located in eastern milksheds have a natural advantage of location as compared with milk producers located in the surplus-producing areas of the Midwest. There are, however, definte limits to this natural advantage, particularly in the sale of cream.

Cream can be shipped long distances at relatively low costs. Costs for hauling cream are about one-tenth of those for hauling market milk. Much cream is

still being separated from market milk in several eastern markets. In New York City, for example, a major part of the cream used is obtained from milk produced in the New York milkshed. As a longtime program, it is good economics for eastern markets to use as market milk as large a proportion of its total production as possible and to make up shortages with shipments of cream from the surplus producing areas of the Midwest. In some markets this will necessitate shifting of some producers from one milkshed to another or working out some method for intermarket shipments of milk.

2. The price for market milk (class I) should be established in a Federal order so that it automatically goes up or down in line with some dynamic factor, such as prices of manufactured dairy products, consumers' income, other farm prices, or some combination of these price series. During World War I there was an epidemic of milk strikes throughout the country accompanied by physical violence, dumping of milk, and much bitterness between milk dealers and dairy farmers over the question of pricing of milk. In sharp contrast to this situation, during the past 8 years most markets have had no milk strikes and, for the most part, producers and dealers have worked together to use the milk produced in the best way possible to meet a shortage of this important product. Why this difference?

This situation can be attributed primarily to three things: First, to the nationwide acceptance of collective bargaining[2] between dairy farmers and milk dealers in setting the wholesale price of milk; second, to the operation of Federal milk orders in some 30 markets with their "rules of the game" and their "umpire" job whereby milk prices of all dealers in most of these markets have been geared to change automatically with changes in prices of manufactured dairy products or other dynamic factors; and third, to the fact that the general level of milk prices has been rising during most of the 14-year period in which Federal orders have been operating. The class I price to farmers under the Chicago Federal order rose automatically from $1.99 per 100 pounds of 3.5 percent milk in September 1939, when the order was initiated, to $5.25 in November 1946, the month of highest prices. Acceptance of rising prices by producers was natural. Dealers accepted price increases because they were in line with those of manufactured dairy products, consumer income, and prices of other farm products. They recognized the fact that they couldn't get milk to supply their needs unless they paid these prices.

The whole Federal order program, however, is still on probation. Its acid test will come when milk prices fall sharply. Will farmers generally accept such price declines under Federal order? In previous periods dealers have been the scapegoats. In our next period, the Government will be the scapegoat. Survival during this period will depend upon vigorous support by the leadership of farm cooperatives, milk dealers, and our educational institutions.

3. The price for market milk (class I) should be established at premiums above prices of manufactured dairy products sufficiently high to get a blend price which will encourage enough but not too much milk to meet market needs. Bottom prices of manufactured dairy products should be kept as high as practical to prevent class I prices being too high, and to prevent dealers who handle a large volume of surplus milk from having an unfair advantage over dealers whose purchases are largely for class I sales. A monthly average of around 20 percent above class I requirements is necessary to meet day-to-day changes in production and sales.

Farmers change production of milk in response to a change in the net blend price, not the class I price. From 1921 to 1946, the net blend price for 3.7 percent milk in the country plant zone averaged $2.41 per 100 pounds for Boston producers and $2.35 for Chicago producers.[3]

The amount of class I premium above prices of manufactured dairy products will tend to vary in different areas. Usually the premium in a so-called deficit area will average higher than in a surplus producing area. In 1947, the Chicago country zone premium for class I milk above the Midwest condensery price averaged 67 cents per 100 pounds compared with $1.42 for Boston and $1.43 for New York.

4. Since it is uneconomical to produce large quantities of grade A or other high-priced milk to be manufactured into lower priced surplus products, premiums paid for class I milk above prices for manufactured dairy products:

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[2] Made possible legally by the passage of the Capper-Volstead Act of 1922.
[3] Exclusive of Government subsidy.

(*a*) Should be larger in months of low production and smaller in months of high production to encourage an annual production more nearly in line with a market's need for milk, and

(*b*) Should be raised on an annual basis if there is too little milk to meet whole milk requirements, and lowered if the blend price results in too much milk in the shortage months to meet whole milk requirements.

Under the Chicago Federal order, premiums for Class I milk for May and June are 50 cents per 100 pounds; from August to November, 90 cents; and for the other months, 70 cents per 100 pounds above the prices paid to condensery producers (or other basic formula price) in this area.

R. W. BARTLETT.

Mr. ANDRESEN. We would like very much to have that.

Mr. BARTLETT. This gets it down to specifics.

Mr. ANDRESEN. Yes. We would like very much to have that.

Mr. BARTLETT. This I am discussing is under No. 5, of my original six points (exhibit I), "The Abuse of Classified Pricing Under a Federal Order."

In recent years (1947–52) the class I price in New York has been held at a level far higher in relation to Chicago's class I price than formerly. Between 1945 and 1952 per capita milk sales in New York declined 15 percent, while those in Chicago increased 5 percent.

It is probable that relatively low consumer income and excessively high class I prices in New York in recent years have been the major factors causing decreased per capita milk sales in this market, along with increased competition of autos, homes, and appliances. Some of the facts relative to this situation are summarized below.

Per capita disposable income in Chicago increased somewhat more in recent years than that in New York. This was a factor which may have contributed to the decrease in per capita sales of milk in New York, while those in Chicago were increasing.

Now may we discuss the class I price in New York as related to class I prices in Chicago (exhibit VI)? I will refer back to what I said a moment ago. The class I prices in Chicago have gone up and down with the manufacturing prices in the entire period of the Federal order operation.

Between 1929 and 1946 the class I price for New York averaged $3.52 per 100 pounds of 3.5 milk, or 62 cents more than Chicago for the class I price ($2.90). From 1929 to 1946 it was an average of 62 cents. I would like to have you keep that in mind.

In recent years the New York class I price exceeded the Chicago class I price as follows: 1947, $1.16; 1948, $1.28; 1949, $1.88; 1950, $1.73; 1951, $1.57; and 1952, $0.94 per 100 pounds of milk. Thus, in the high year of 1949, the difference between these price series was 3 times that of the 18-year average of 1929 to 1946, while in other years it was substantially higher. In other words, we had $1.88 in 1949 as compared with an 18-year average of 62 cents. The facts indicate that the New York class I price during the past few years has been entirely out of line with its competitive level.

Mr. ANDRESEN. Does that take into consideration the differences in the cost of production between the two areas?

Mr. BARTLETT. I am assuming, Mr. Andresen, that the 62 cents from 1929 to 1946 constitutes probably the difference you are speaking of. Then I have a chart which I will include in the exhibit on this. I have it for each year from 1929 to 1952.

(The information is as follows:)

EXHIBIT VI

V. ABUSE OF CLASSIFIED PRICING OF MILK UNDER A FEDERAL ORDER

In recent years (1947–52) the class I price in New York has been held at a level far higher in relation to Chicago's class I price than formerly (fig. 1). Between 1945 and 1952 per capita milk sales in New York declined 15 percent, while those in Chicago increased 5 percent (table 1).

TABLE 1.—*Changes in per capita milk sales and disposable consumer income, New York and Chicago, 1940–52*

	Per capita milk sales				Per capita disposable income	
	New York [1]		Chicago [2]			
	Actual pints daily	Index (1940–44=100)	Actual pints daily	Index (1940–44=100)	New York [3] (1940–44=100)	Chicago [3] (1940–44=100)
1940	0.74	91	0.60	92	76	73
1941	.76	94	.60	92	87	88
1942	.78	96	.64	97	101	103
1943	.85	105	.70	107	112	112
1944	.92	114	.73	112	124	124
1945	.95	117	.74	113	132	130
1946	.94	116	.77	118	136	138
1947	.88	109	.76	117	139	149
1948	.84	104	.76	116	149	165
1949	.83	102	.77	117	145	155
1950	.82	101	.77	117	156	166
1951	.82	101	.77	118	162	178
1952	.81	100	.78	119	159	183

[1] Data obtained through the courtesy of Leland Spencer, Department of Agricultural Economics, Cornell University.

[2] Computed from data of Chicago Market Administrator, Order 41, Reporter; Order 69, Market News; and United States Census of Population.

[3] Survey of Current Business, August 1952. Data for New York and Illinois less Federal income taxes. Estimates for 1952.

It is probable that relatively low consumer income and excessively high class I prices in New York in recent years have been the major factors causing decreased per capita milk sales in this market, along with increased competition of autos, homes, and appliances. Some of the facts relative to this situation are summarized below.

1. Per capita disposable income in Chicago increased somewhat more in recent years than that in New York (table 1). This was a factor which may have contributed to the decrease in per capita sales of milk in New York, while those in Chicago are increasing.

2. Between 1929 and 1946 the class I price for New York averaged $3.52 per 100 pounds of milk, or 62 cents more than Chicago for class I price ($2.90) (figures 1 and 2). In recent years the New York class I price exceeded the Chicago class I price as follows: 1947, $1.16; 1948, $1.28; 1949, $1.88; 1950, $1.73; 1951, $1.57; and 1952, $0.94 per 100 pounds of milk. Thus, in the high year of 1949, the difference between these price series was three times that of the 18-year average of 1929–46 (62 cents), while in other years it was substantially higher.

3. Normally, September, October, and November are months of least surplus production. In 1946 milk in excess of class I sales in the New York market amounted to 20 percent of the total milk receipts; in 1947, 24 percent; in 1948, 29 percent; in 1949, 41 percent; in 1950 and 1951, 36 percent; and in 1952, 38 percent (figure 3).

Questions which may well be raised are: Were the class I prices fixed under the New York Federal order from 1947 to 1952 necessary to secure enough milk to meet the class I needs of the market? Would per capita sales of milk in New York have declined as much as they did if the New York class I prices had been in line with their historic relationship with Chicago class I prices, namely 2 to 3 cents a quart lower than they actually were?

VI. Exaction of Cream Prices Higher Than Their Competitive Level

Assuming the operation of the law of comparative advantage, both milk and cream should be produced in the areas where cost of getting them produced plus transport costs are the lowest. Costs for transporting 100 pounds of milk as cream are roughly one-tenth of those of whole milk. Hence, this makes it possible to transport cream economically for long distances and accounts for the fact that both Boston and Philadelphia regularly buy cream from midwestern surplus-producing States such as Michigan, Wisconsin, and Minnesota. Therefore, prices for cream in Boston and Philadelphia are competitive with prices of midwestern cream.

New York in contrast to Boston and Philadelphia has tended to limit its source of cream to areas closer to the market with the result that during the past 16 years New York cream prices have averaged about 20 percent higher than those of Philadelphia or Boston (table 2).

From 1937–52 the New York price per 10-gallon can of 40 percent cream averaged $29.26 or 21.6 percent more than the Philadelphia price ($24.07) and 21.1 percent more than the Boston price ($24.17). In 1952 the New York cream price averaged $39.19, the Philadelphia price, $32.84, and the Boston price, $33.64 per 10-gallon can.

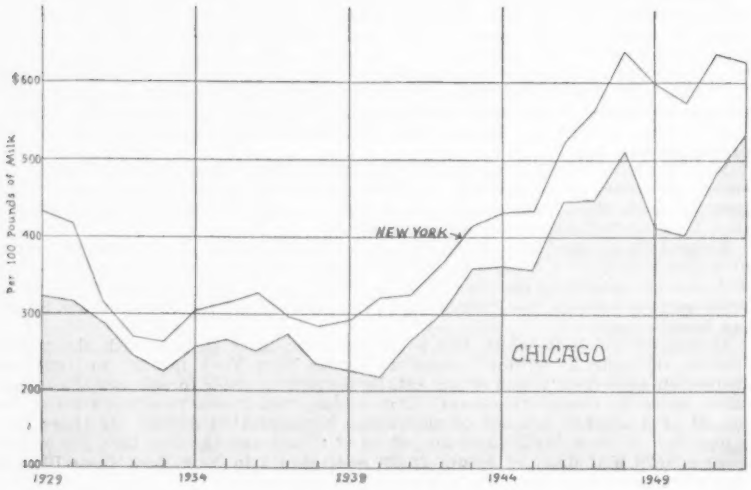
Questions which logically can be raised are: Is it in line with the public interest of some 13 million consumers in the New York market to limit the inspection area from which cream can be secured in order to enhance the cream price above its competitive level? Are midwestern cream producers being deprived of a market because of restriction of inspection areas? Is there any connection between high wholesale prices of cream and the fact that per capita sales of 0.23 pint daily of cream (milk equivalent) in New York from 1948 to 1951 were about half those for 1929 to 1933 (0.408 pint)? [1]

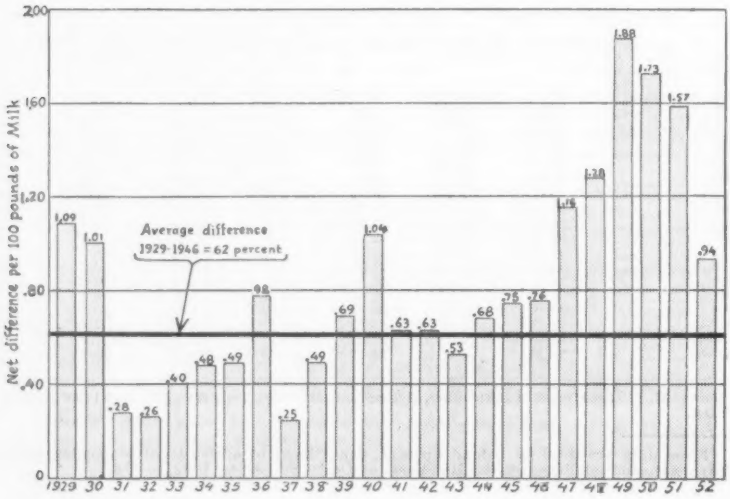
Table 2.—*Comparison of 40 percent cream prices in New York, Philadelphia, and Boston, 1937–52*

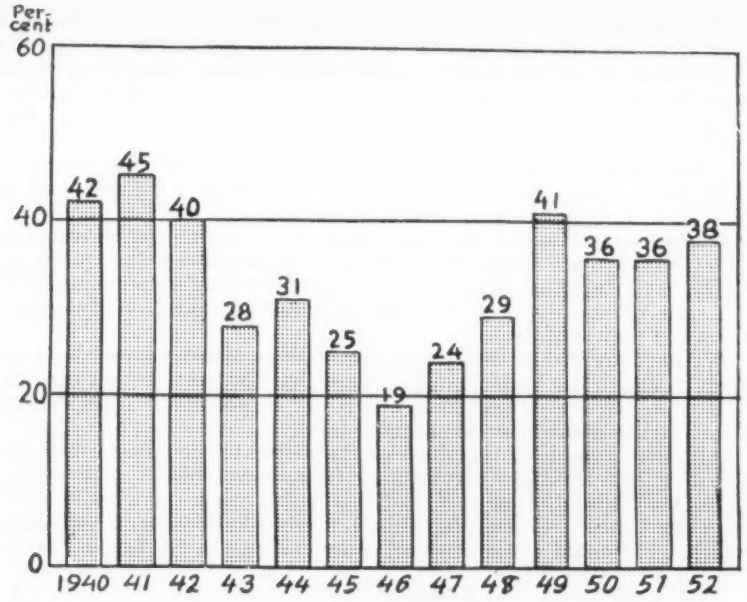
Year	Prices (dollars per 40-quart can)			Actual differences New York from—		Percent differences New York over—	
	New York	Philadelphia	Boston	Philadelphia	Boston	Philadelphia	Boston
1937	18.18	16.59	15.99	+1.59	+2.19	9.6	13.7
1938	16.98	13.02	13.50	+3.96	+3.48	30.3	25.8
1939	17.18	12.87	12.92	+4.31	+4.26	33.5	33.0
1940	19.29	13.73	13.87	+5.56	+5.42	40.5	39.1
1941	22.21	17.47	17.37	+4.74	+4.84	27.1	27.9
1942	24.65	19.08	19.46	+5.57	+5.19	29.2	26.7
1943	28.29	23.96	23.55	+4.33	+4.74	18.1	20.1
1944	28.66	24.27	23.63	+4.39	+5.03	18.1	21.3
1945	28.78	24.89	24.75	+3.89	+4.03	15.6	16.3
1946	37.22	32.41	32.26	+4.81	+4.96	14.8	15.4
1947	38.50	32.87	32.28	+5.63	+6.22	17.1	19.3
1948	42.53	35.76	36.00	+6.77	+6.53	18.9	18.1
1949	33.97	26.53	27.36	+7.44	+6.61	28.0	24.2
1950	34.35	27.11	27.64	+7.24	+6.71	26.6	24.3
1951	38.12	31.83	32.47	+6.29	+5.65	19.1	17.4
1952	39.19	32.84	33.64	+6.35	+5.55	19.3	16.5
1937–42	19.75	15.46	15.52	+4.29	+4.23	27.7	27.3
1943–48	34.00	29.03	28.75	+4.97	+5.25	17.1	18.3
1937–52	29.26	24.07	24.17	+5.19	+5.09	21.6	21.1

Source: U. S. Department of Agriculture, Agricultural Statistics, 1947, 1949, 1951, and other releases of USDA.

[1] From data prepared by Leland Spencer, department of agricultural economics, Cornell University, and published in the Handbook of Dairy Statistics, 1952, p. 113.


$600
500
400
300
200
100
Per 100 Pounds of Milk
NEW YORK
CHICAGO
1929
1934
1939
1944
1949


2.00
1.60
1.20
.80
.40
0
Net difference per 100 pounds of Milk
Average difference
1929-1946 = 62 percent
1.09
1.01
.28
.26
.40
.48
.49
.98
.25
.49
.69
1.04
.63
.63
.53
.68
.78
.76
1.18
1.28
1.88
1.73
1.57
.94
1929 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



Mr. BARTLETT. From 1929 to 1946 it averaged 62 cents. Now, in 1943 it was 53 cents; 1944, 68 cents; 1945, 75 cents; 1946, 76 cents; and then it jumps right up in the last few years clear out of line.

Then let us observe the changes which have taken place in excess milk which resulted from this high price. Normally September, October, and November, are months of least surplus production. In 1946 milk in excess of class I sales in the New York market amounted to 19 percent of total milk receipts; in 1947, 24 percent; in 1948, 29 percent; in 1949, 41 percent; in 1950 and 1951, 36 percent, and in 1952, 38 percent.

In other words, in September, October, and November, 1949 41 percent of all the milk produced in the New York market went into manufactured uses or cream. That is in the month of least surplus production. I am just taking those shortage months because that is the period when a market usually is short of milk.

Mr. ANDRESEN. I believe you will find that it is higher there now.

Mr. BARTLETT. I think that is true. To me it is clearly a question of the Federal order being used as a trade barrier with respect to fixing class I prices too high.

Mr. ANDRESEN. Well, it has been advantageous for the producers in these areas to go out into our country and buy good milk cows and bring them back in to produce more milk.

Mr. BARTLETT. That is right.

Mr. ANDRESEN. That is how you create the surplus.

Mr. BARTLETT. True; plus more feed per cow.

Going back to the question raised here by one of the other gentlemen, as to what to do about it. My own reasoning is that an amendment to the Agricultural Marketing Agreements Act is probably

necessary to spell out specifically the ways in which we can make sure that the law of comparative advantage is permitted to operate throughout all of our Federal order market areas, and to make sure that the milk in each market is produced in the area where the costs of getting it produced plus the transport costs are the lowest. The Federal order was not initiated to act as a trade barrier.

I have been one of the strongest proponents of Federal orders over a 19-year period. I have been working with them in Chicago and in St. Louis, and have helped in putting them in over the dead bodies of certain people who did not want them in. I know Mr. Glover and Mr. Burchard of Heard's Dairyman always raised the question: "What are we going to do when they get to acting as a monopoly?"

I said, "The thing to do is to get your facts as to monopoly operations and then stop them."

We have arrived at that point now, and we either have to have an amendment to the Federal order to see that the act does not operate as a trade barrier or find some other way to prevent it from raising class I prices above their competitive level.

Another example of the abuse of the Federal order program is the so-called compensatory payments. In essence, this is a technique to use the Federal order as a trade barrier to exact a monopoly price for class I milk. Concerning this, I would like to submit testimony which I presented at the Federal order hearing in St. Louis, March 3, 1953, as exhibit VI–A.

(The information is as follows:)

EXHIBIT VI–A

TESTIMONY AT THE ST. LOUIS FEDERAL ORDER HEARING TUESDAY, MARCH 3, 1953[1]

I would like to review some principles for pricing market milk discussed in New York before a market administrators conference there in 1948. These were published in Illinois Farm Economics of October 1948 as follows:

"1. Both milk and cream should be produced in areas where costs of getting milk produced plus transport costs are the lowest. * * *

"2. The price for market milk (class I) should be established in a Federal order so that it automatically goes up and down in line with some dynamic factor such as prices of manufactured dairy products. * * *

"3. The prices for market milk (class I) should be established at premiums above prices of manufactured dairy products sufficiently high to get a blend price which will encourage enough but not too much milk to meet market needs. Bottom prices of manufactured dairy products should be kept high as practical to prevent class I prices being too high, and to prevent dealers who handle a large volume of surplus milk from having an unfair advantage over dealers whose purchases are largely for class I sales. A monthly variation of around 20 percent above class I requirement is necessary to meet day-to-day changes in production and sales. * * *

"4. Since it is uneconomical to produce large quantities of grade A or other high priced milk to be manufactured into lower priced surplus products, premiums paid for class I milk above prices for manufactured dairy products:

"(a) Should be larger in months of low production and smaller in months of high production to encourage an annual production more nearly in line with a markets need for milk; and

"(b) Should be raised on an annual basis if there is too little milk to meet whole milk requirements and lowered if the blend price results in too much milk in the shortage months to meet whole milk requirements."

Discussion of proposed provisions relative to approved plants, unapproved plants, and compensatory payments: The proposed provisions relative to ap-

[1] Presented by Roland W. Bartlett, professor of agricultural economics, University of Illinois.

proved plants, unapproved plants and compensatory payments, in essence, constitute trade barriers, and as such, not only are against the public interest but may well be construed as discrimination under the Agricultural Marketing Agreements Act of 1937.

One may well raise questions such as:

1. Did the Agricultural Marketing Agreements Act of 1937 propose to "freeze" plants shipping to any market to those already disposing of 65 percent or more of their sales as class I milk?

This question was answered by N. P. Cladakis formerly market administrator of the Chicago and New York markets, in a talk given at the University of Illinois in January 1940, as follows: "The fact should be emphasized that Federal order regulation is limited to the features prescribed by law. Under this regulation (Agricultural Marketing Agreements Act of 1937) hauling charges are not regulated, prices of milk between distributors are not regulated, production of milk is not regulated, new producers are not kept from coming on the market, a market to farmers is not guaranteed, and cooling station charges as well as other features are not regulated."

If the above proposal were incorporated into the St. Louis Federal order, a group of new producers in an unapproved plant would be prevented from coming into the market on the same terms as old producers even though they met the sanitary requirements of the St. Louis Board of Health. Clearly this was not the purpose of the Agricultural Marketing Agreements Act.

2. Why should a distributor be required to pay more than the class I price for milk used as class I?

According to the proposal relative to compensatory payments, a dealer buying class I from an unapproved plant would be required to pay:

(1) the price for grade A milk exacted by the operator of the unapproved plant;

(2) handling charges exacted by the operator;

(3) transportation costs to the city market; and

(4) a penalty payment over and above the sum of the amount exacted in Nos. 1, 2, and 3, by the amount that the St. Louis class I exceeded the St. Louis class I price. Supposing for example that the "compensatory" proposal had been in effect, and that distributor A bought 100,000 pounds of class I milk from an unapproved plant in January 1953. In that month the St. Louis class I price was $5.412 and the class II price was $3.509, or a net difference of $1.903 per 100 pounds of milk.

The penalty charges on this milk would have been 1,000 (hundredweight) times $1.903, or $1,903.

3. What was the decision of the United States Supreme Court relative to the Babylon case (*Kass* v. *Brannon*, United States Court of Appeals, Dec. 5, 1951, and United States Supreme Court, Apr. 30, 1952)?

This question was answered in the News for Dairy Co-ops published by the National Milk Producers Federation, November 28, 1952, as follows:

"Supreme Court refuses Babylon case review.

"The United States Supreme Court this month refused to review the Babylon case involving the New York milk marketing order. This leaves standing a decision of the United States Court of Appeals holding invalid a provision of the order calling for compensatory payments on outside milk.

"The case arose out of compensatory payments charged against cream and condensed milk brought into the New York market from Ohio and used in the manufacture of ice cream. The New York order provides for compensatory payments to be distributed to producers on the New York market through the producer settlement fund.

"The court of appeals held that the compensatory payments resulted in prices to handlers which were not uniform as required by the Marketing Agreement Act.

"The court also pointed out that there is no specific authorization for compensatory payments in the act. The provision in the New York order should not be justified under the incidental clause, the court ruled, because the compensatory payments resulted in prices to handlers which were not uniform. It was therefore inconsistent with other provisions of the act."

4. Will not the removal of all requirements relative to proportions of milk sold in class I uses, result in encouraging many new plants to get in on the marketwide pool and result in an unbearably large surplus?

Answer: Not if grade A class I milk is reasonably priced. In this connection may I repeat two principles emphasized previously, namely:

"1. Both milk and cream for any market should be produced in areas where costs of getting milk produced plus transport costs are the lowest * * * and

"3. The price for market milk (class I) should be established at premiums above prices of manufactured dairy prices sufficiently high to get a blend price which will encourage enough but not too much milk to meet market needs * * *."

Under normal conditions, producers in or adjacent to the St. Louis milkshed are going to try to sell milk to a market where they get the highest price. They respond to the blend price paid and not the class I price. If the St. Louis grade A blend price less transportation on a 12 months' basis is higher than they are now receiving for milk, under normal conditions, they will want to get on the market and should be permitted to do so. On the other hand, if, on a 12 months' basis they can get a higher price in some other market, under normal conditions, they will leave the St. Louis market, and should be permitted to do so.

5. Should grade A plants be permitted regularly to come on the market in certain seasons and leave the market during other seasons of the year?

Answer: Definitely not. The choice of being on or off the St. Louis market should be based upon supplying the market at all seasons of the year.

Mr. ANDRESEN. If you are familiar with the act, you have probably noticed a provision in it which was put in it at my insistence, that no order should be approved which would prohibit the shipment of milk into a milk marketing area from outside of the area.

Mr. BARTLETT. That is right.

Mr. ANDRESEN. Of course I claim that has never been carried out or ever administered.

Mr. BARTLETT. That is right. Maybe all that is necessary is to enforce the present act. I do not know. I am inclined to think before we are through we will have to spell it out so that there will be no confusing the issue.

Mr. ANDRESEN. As I understand it, you stated you have been a strong supporter of the Milk Marketing Act?

Mr. BARTLETT. That is right.

Mr. ANDRESEN. As I understand it, you have changed your opinion?

Mr. BARTLETT. No. Let us put it this way, Mr. Andresen: I would not burn the house down just because we had a crack in the ceiling. I would try to fix the crack.

These Federal orders now are getting to the place where they are acting as trade barriers in some places. The Federal order has done a tremendous amount of good in most markets of the United States. We have had regulation of grain and butter and cotton for 50 to 100 years. We have not had regulation of milk. It is absolutely essential to the efficient marketing of milk to have a Federal order or some type of regulation, but it is not necessary to have Federal regulation which acts as a trade barrier.

Specifically in the Chicago market before we had Federal regulation we had recurrent milk strikes. We had dumping of milk. We had chaos in the market. The farmers were always fighting the dealers. That was unhealthy from a market point of view.

Now, with the tying of the class I price to the manufactured price, going up and down with the manufacturing level, it has been possible for the producers' association to center its attention on merchandising milk. Also, it has been possible for the dealers to do it. Instead of fighting all of the time they are beginning to merchandise milk.

I am very pleased with the present program under Mr. McWilliams, present manager of the Chicago Pure Milk Association. I was in Chicago about 2 months ago and he had all of the dealers together, and they were studying ways of how to expand the market for milk.

That is much better than fighting. They now get together as businessmen and map out programs of mutual interest.

The basic fundamentals of the Federal order are still sound, but we have a crack in the ceiling. If we do not fix the crack the whole structure is in danger.

Mr. ANDRESEN. I might inject here, Professor Bartlett, that this committee is primarily concerned with the welfare of the producers.

Mr. BARTLETT. Yes.

Mr. ANDRESEN. We want to keep the dairy farmers going, with an expanding economy in the country, and give them the proper incentive to produce in abundance. We are not unmindful of the welfare of the consumers. I thought I ought to let you know we are primarily a producers' committee.

Mr. BARTLETT. I might interpret that, Mr. Andresen, that you were interested in all dairy producers and not just specific vested interests of certain dairy groups.

Mr. ANDRESEN. Well, that is why I put that amendment into the act of 1937.

Mr. BARTLETT. Yes.

Mr. MCINTIRE. I have a question for Dr. Bartlett.

In your statement you said that you feel it is necessary to make some change in the milk marketing orders or in the framework of that legislation by the amendment you suggested, implementing areas with the ability to produce, considering the cost of production plus the cost of transportation, to have a free play in distribution. I am sure you are not overlooking that producers in other areas have artificial barriers which are outside the jurisdiction of the milk marketing orders, which contribute to their costs of production.

Mr. BARTLETT. That is right. May I just take a moment now to get into this other phase, which is the inspection phase, the information on which I have with regard to New York.

I might suggest, Mr. Andresen, that we include all of these. I guess maybe we have already done that, for all of these materials. I am just picking out certain parts to discuss in this typed material, as part of the record, because I have stated this specifically.

Mr. ANDRESEN. We will give you the opportunity, if there is no objection, to revise your remarks and to include such other statements as you have, which you might want to have in the record.

Mr. BARTLETT. Thank you. This is dealing with the exaction of cream prices higher than the competitive level (exhibit VI).

Assuming the operation of the law of comparative advantage, both milk and cream should be produced in the areas where cost of getting them produced plus transport costs are the lowest (exhibit V).

Costs for transporting 100 pounds of milk as cream are roughly one-tenth those of whole milk. Hence, this makes it possible to transport cream economically for long distances and accounts for the fact that both Boston and Philadelphia regularly buy cream from midwestern surplus-producing States such as Michigan, Wisconsin, and Minnesota. Therefore, prices for cream in Boston and Philadelphia are competitive with prices of midwestern cream.

New York in contrast to Boston and Philadelphia has tended to limit its source of cream to areas closer to the market with the result that during the past 16 years New York cream prices have averaged

about 20 percent higher than those of Philadelphia or Boston, as shown in table 2 of exhibit VI.

From 1937 to 1952 the New York price per 10-gallon can of 40 percent cream averaged $29.26 or 21.6 percent more than the Philadelphia price ($24.07) and 21.1 percent more than the Boston price ($24.17). In 1952 the New York cream price averaged $39.19, the Philadelphia price, $32.84, and the Boston price, $33.64 per 10-gallon can.

That is roughly $6 a can higher for the New York cream. Questions which logically can be raised are: Is it in line with the public interest of some 13 million consumers in the New York market to limit the inspection area from which cream can be secured in order to enhance the cream price above its competitive level?

Are midwestern cream producers being deprived of a market because of restriction of inspection areas? Is there any connection between high wholesale prices of cream and the fact that per capita sales of 0.23 pint daily of cream (milk equivalent) in New York from 1948 to 1951 were about half those for 1929–33, 0.408 pint? (Exhibit VI.)

From data prepared by Leland Spencer, department of agricultural economics, Cornell University, and published in the Handbook of Dairy Statistics, 1952, page 133, is shown the comparison of 40 percent cream prices in New York, Philadelphia, and Boston from 1937 to 1952.

(The document referred to above appears at p. 463.)

In other words, the inspection of cream in the New York area has been limited pretty much to their own milkshed or creamshed.

Mr. ANDRESEN. Mr. Williams?

Mr. WILLIAMS. Dr. Bartlett, you have stated here that you thought the restrictions of different boards of health were too severe in inspecting dairies and the handling of milk that goes into the fluild market and the cream market; is that correct?

In other words, you want New York State to lower their standards of inspection for western milk and western cream in order to take it into the New York milk market.

Is not that what you said?

Mr. BARTLETT. No; I maintain that the people, the 13 million consumers in New York, are just as healthy as the 3 million consumers in Boston.

During the past 18 years Boston has been buying midwestern cream for table use. I see no reason why New York should not do the same thing.

Mr. WILLIAMS. You do say there that New York's Board of Health inspection is too severe?

Mr. BARTLETT. No; I said that they limit their inspection areas and will not permit this outside cream. Let me qualify this. I am not a dairy technologist, but I am predicating my reasoning upon the facts, namely, that Boston, over a long period of years, has bought midwestern cream of quality, high quality cream, set down in Boston that meets very rigid inspections.

They have permitted out-of-market cream in any volume at any time.

Mr. WILLIAMS. You did say here that some of the board of health inspections were not necessary, did you not?

Mr. BARTLETT. Some of the farm inspections based upon—this gets back to the point that was brought out in the National Research Council report—some of the board of health inspections have no validity whatsoever in relation to quality.

Mr. WILLIAMS. What are those regulations?

Mr. BARTLETT. Some of the farm inspections. They require certain things in regard to——

Mr. WILLIAMS. What are they?

Mr. BARTLETT. Specifically, they found—this is a study of Dr. Prucha, of our own station—he found that some cities require open-top milk pails. Others required producers to have the closed-top pails. Some farms shipping milk to both markets had to have both sets. Then a farmer had to first ask the question, Where is the inspector from and which market does he represent? When he found this out, he would pull out the set of pails that the law requires. Such requirements are absolutely silly, and of no use whatsoever.

Mr. WILLIAMS. That is the use of a pail?

Mr. BARTLETT. That is one of many. They have a whole series of things that they, the National Research Council, take point by point and they compare those with the quality. There are probably half of the requirements of farm inspection that have no validity whatsoever in relation to quality of cream or quality of milk.

This is not based upon dairy economists' reasons. This is based upon a study by dairy technologists. I think Dr. Hammerberg was one of the New York men who was on this committee and worked on this study.

Mr. WILLIAMS. I would not want to go on record to say that I want to lower the standards of sanitary inspection of the production of milk anywhere. I do not think you can have it produced too cleanly or under any too rigid an inspection. It is a product that must be produced under every possible sanitary inspection.

Mr. BARTLETT. Sir, you would not intimate that it would be desirable to put rules in that had nothing to do with quality, would you?

Mr. WILLIAMS. No, I do not.

Mr. BARTLETT. That is what this research council stated, that many of the things that are required have no relation whatever to quality.

Mr. WILLIAMS. I am rather familiar with the production right out on the farm. I do not think that the program now under effect in New York State with respect to the production of fluid milk and cream is too rigid in any way.

We are defending the health of the consumers of milk, fluid milk, and dairy products, in the State of New York with every consideration as to the board of health inspection out on the farms where it is processed.

I hate to have you come in here and say that some of those restriction should be eliminated.

Mr. BARTLETT. I am telling the truth as I see it.

Mr. JONES. Mr. Williams, would you yield?

Mr. WILLIAMS. Yes.

Mr. JONES. I got in a little late. Where was this where they had to have two sets of milk pails to meet the different inspections?

Mr. BARTLETT. I think that was in a New Jersey territory. I would have to check on that.

Mr. JONES. Are you intimating that the State authorities required one type of pail and the Federal authorities required another type of pail?

Mr. BARTLETT. No. It was different municipalities. I would go along with this gentleman from New York in the viewpoint that I think that by and large New York has done a wonderful job on inspecting their milk and done it very economically.

By and large, in New York they have gone on the principle of platform inspection much more than some of the United States Public Health ordinances.

But usually it is the municipality that puts in ordinance provisions, and one municipality puts in one set, another municipality puts in another set, and the producer may be in one of those marginal territories where he goes first to one or the other.

In those cases, of course, some of the regulations are absolutely ridiculous.

Mr. WILLIAMS. These different cases that you cite here may be a particular distributor in a municipality that has a particular kind of trade.

Mr. BARTLETT. No, these are not. These are municipal requirements, not distributor requirements.

Mr. ANDRESEN. In New York, there you have a State law that supersedes any local ordinance.

Mr. WILLIAMS. That is right. You have your State inspection, your municipal inspection, and also your distributor inspection. You have three of them. That is all right. You do not complain about that?

Mr. BARTLETT. Distributor inspection is usually under the supervision of State or municipal inspection. It is a practical way of getting enforcement of quality requirements at a low cost. I have no complaint of the three types of inspection if they are properly integrated and if the requirements are necessary to get high-quality milk.

Now, let's get away from technicalities. The fact is that the price of cream in New York from 1947 to 1952 has been $5 to $6 a can more than in Boston or Philadelphia.

Boston is shipping midwestern cream regularly for table use in Boston. I do not believe, personally, that the 13 million consumers in New York are much more tender and delicate than the 3 million consumers in Boston.

I do not believe that there is any need, in fact, for requirements in New York that they do not have in Boston.

Mr. WILLIAMS. Is it not true that the board of health inspection has been the competitive one item in milk transportation between the West, the Middle West, and New York State for a great many years?

This question of board of health inspection, inspection out on the farm where it is necessary?

Mr. BARTLETT. I think that that is probably true, and that what this recent research committee found, that many of those requirements had no validity in fact.

Mr. WILLIAMS. A great many of the Western States have not had the program of inspection that New York State has because they have been producing for a manufacturer's market in many of the Western States over a period of years.

Mr. BARTLETT. That is true, though some surplus producing States such as Minnesota and Wisconsin are now doing a good job in producing high-quality milk for manufacturing uses as well as for market milk uses.

Mr. WILLIAMS. It does not require as rigid a board of health inspection as does the fluid market?

Mr. BARTLETT. I would say this, though, that Chicago has had grade A for the past 26 years, and my knowledge of the requirements in Chicago indicate that its grade A requirements are probably more rigid than the New York requirements for milk.

Mr. WILLIAMS. Does that apply to cream and butter, too?

Chicago has grade A cream; not butter. Butter is not included in any of these that I am talking about now.

Mr. WILLIAMS. You use cream for butter manufacturing?

Mr. BARTLETT. What do you mean by that?

Mr. WILLIAMS. This cream that is produced here and manufactured into butter, you do not inspect that at all?

Mr. BARTLETT. Let's put it this way: No municipality in the United States that I know of has ordinances regulating the quality of butter. The butter is graded frequently by United States inspectors, Federal inspection.

You have Land O'Lakes, 93-score butter. But the cities, the city ordinances were originated with the idea of protecting the people for market milk and cream primarily.

When you buy evaporated milk, that is a sterile product. They do not have to protect that in the same way.

Midwestern evaporated milk goes into New York with no inspection whatsoever. When midwestern cream is used in New York, if and when these trade barriers of New York are broken down as I think they will be within a reasonable length of time, then New York should insist that the cream meet certain standards of quality in the same way that Boston has insisted on that.

Boston has been very careful to insist on a high-quality cream. They set up the standards; they have it checked in the Midwest; they have it checked again when it gets to Boston.

If it does not meet those requirements then it cannot be used for table uses. But those are standards of quality of the cream itself and not primarily farm inspection.

Mr. WILLIAMS. Then you think that you ought to just test your cream and pay no attention to the farm inspection at all? If the cream itself meets the quality requirement, you do not care how it is produced on the farm?

Mr. BARTLETT. I would say if you had cream that had a low acidity, a low count of bacteria, a good flavor, and a low sediment count, that standards could be set up that would insure the consumer a high-quality cream with no farm inspection whatsoever.

Mr. WILLIAMS. You want to do away with farm inspection?

Mr. BARTLETT. No; I would not. Some farm inspection helps the fellow meet these quality requirements that can be tested out on the basis of the product. I would not do away with farm inspection altogether, but I would say that it is unnecessary for New York people to go back to Wisconsin or Michigan or Minnesota farms and inspect the cream. They can get a high-quality cream, just as

high quality cream as they are using today, without any farm inspection by their own inspectors.

Mr. ANDRESEN. You mentioned Minnesota. We have a very strict inspection on the farms and in the creameries. I have been in a good many of these creameries to see the milk and cream brought in. The creamery operator goes through a very thorough inspection and sometimes refuses to accept the milk or the cream from the farmer if it does not come up to a certain standard.

In that manner you get corrections there because of inability to market the product produced on the farm where they do not have the sanitary requirements.

On the other hand, they are getting so very strict in our State that they are demanding milk towers that cost fifteen to twenty thousand dollars to construct, with all the cooling systems, so the milk goes from the cow to a pipeline, is cooled, and goes into the truck that comes there to haul it.

So I sometimes think the inspection is getting pretty expensive, especially in a falling market when the prices are going down.

Mr. BARTLETT. Wisconsin has a State law in regard to quality, too. They are trying to get high quality right across the board for all types of milk.

Mr. ANDRESEN. Are there any further questions?

Mr. LOVRE. Mr. Chairman.

How many communities have broken down these trade barriers?

Mr. BARTLETT. I did not get the first sentence.

Mr. LOVRE. How many communities have broken down these trade barriers that you have said are injurious to the farmers and consumers?

Mr. BARTLETT. I cannot state it exactly. I would say, roughly, a fourth of the markets in the country have relative freedom from trade barriers.

Mr. LOVRE. Where they had trade barriers before and they have been broken down?

Mr. BARTLETT. Usually, yes. Chicago, from 1902 until 1930, had a rigid trade association monopoly. The store price and the home delivered price were the same during this period. Chicago had the most monopolistic condition of any market in the United States. Then it broke down during the period of 1931–39.

Just as a matter of record, which is just an incidence of interest, Al Capone got into the milk business and broke down the trade barriers in Chicago.

Mr. WILLIAMS. Is that what he went to jail for?

Mr. BARTLETT. No; he went to jail for failure to pay his income tax. The Meadowmoor Dairy came in and broke down the trade barriers. It was really a tough battle. I do not think he did it for that purpose.

Mr. LOVRE. Are there any other cities with like situations?

Mr. BARTLETT. You mean like Chicago?

Mr. LOVRE. Yes.

Mr. BARTLETT. Oh, yes. Competition is pretty keen in New York City on the distribution side. The dealers' gross handling margin—this is of interest to you, Mr. Andresen—the handling margins in New York and Washington are among the lowest for store distribu-

tion of any cities in the United States. The handling margins in Washington are very low and have been so for 8 or 10 years, for store distribution.

That does not mean that they cannot be lower, but they are relatively low. I have a record of 24 cities of 300,000 and over, with handling margins in each of these cities, from 1929 to 1952.

I use that as my criterion of measuring whether a city is efficient or inefficient.

Mr. ANDRESEN. Do you not find considerable resistance in Chicago when you reduce the profit margin and the cost of distribution?

Mr. BARTLETT. Yes. There was plenty of resistance that was eventually broken down (exhibit II). I just saw a news release last week of material presented by Dr. Castle. He was talking about the relatively small amount of profit that dealers get. That material has no substance whatsoever if he included the inefficient dealers which have high costs.

I would like to turn to my bulletin, Measuring Efficiency of Milk Plant Operation, Experimental Station Bulletin 560. I would like to have this included as exhibit VII, pages 1 to 22, and then refer to table 1. Man-minutes per hundred gallons for 13 dealers ranged from 550 man-minutes down to 86. That is for plant operation.

(The information is as follows:)

EXHIBIT VII

[Bulletin 560, University of Illinois, Agricultural Experiment Station]

MEASURING EFFICIENCY OF MILK-PLANT OPERATIONS

(By R. W. Bartlett and F. T. Gothard[1])

When anyone buys a bottle of milk, to all appearances he is completing a simple sales transaction. He pays one man so many cents for so many fluid ounces of nutrition. Actually he is paying not one man but several. The farmer who produces the milk is responsible for part of its cost. The dealers who handle it are also responsible; they must process, bottle, store, deliver, and sell the milk. The price of a bottle of milk thus is influenced by both the efficiency of milk production and the efficiency of milk-plant operations.

For several decades major attention in the dairy departments of our land-grant colleges has been centered upon ways of increasing the efficiency of milk production. The usefulness of such studies is evidenced by the fact that the average production per cow in Illinois, for example, is now 61 percent higher than that of 50 years ago and is 30 percent higher than of 25 years ago.[2] Increased efficiency in production undoubtedly has been one of the factors contributing to high per capita sales of milk in the United States.

Until recently, however, relatively little attention was devoted to studies on how to increase the efficiency of milk distribution, even though in many markets, dealers' gross margins make up more than half the price consumers pay for milk. In 1949 consumers in 10 Illinois markets paid an average price of 17.8 cents per quart for milk at stores and 19.7 cents for home-delivered milk.[3] Farmers received 47 percent of the store price paid by consumers and 42 percent of the home-delivered price. From the viewpoint of the consumer, studies centered upon increasing the efficiency of milk distribution are even more important than those aimed at securing lower costs of farm production.

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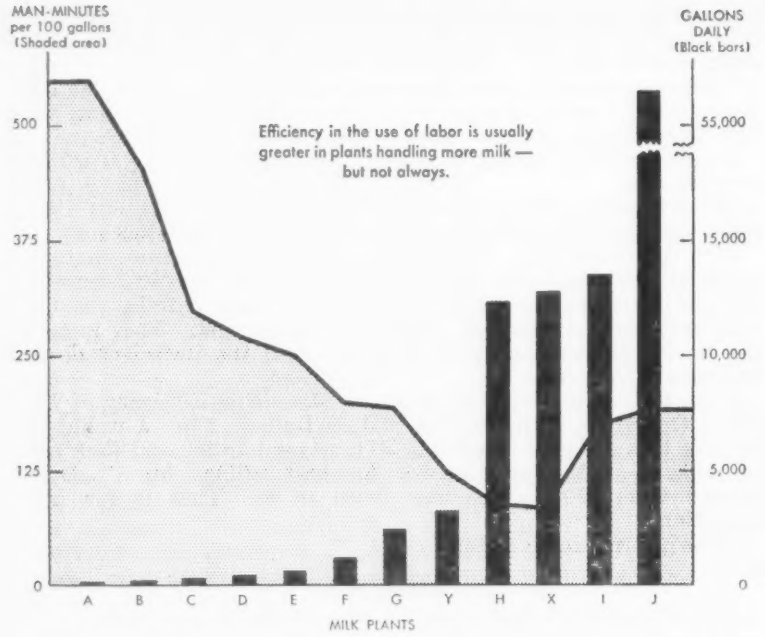
[1] R. W. Bartlett, professor of agricultural economics; and F. T. Gothard, formerly assistant in agricultural economics. This study was supported in part by funds authorized by the Research and Marketing Act of 1946.

[2] Data from Historical Census of the United States, 1789–1945, U. S. Department of Agriculture and U. S. Bureau of the Census; and from Illinois State Department of Agriculture.

[3] Illinois Farm Economics, October–November 1950, pp. 1073–1084.



What factors are involved in efficient milk distribution? Why are some plants more efficient than others? How can a manager or plant owner increase the efficiency of his plant? It is with these questions in mind that the University of Illinois has during the past few years carried on studies to measure efficiency in the use of labor, space, electric power, and steam power for the principal operations of market-milk plants. Measurements have been made both in physical units and in money units.

Two plants, plant X in Illinois and plant Y in Minnesota, were selected for detailed analysis. They were chosen because in 1946 they were operating at a high degree of efficiency. The operations of plant X were found to be the most efficient of those for all plants for which data have been available to the authors.[4] Plant Y, whose volume was less than that of plan X, operated somewhat less efficiently.

Plants X and Y were accessible to the authors, and their personnel were willing to cooperate in the investigation. The managers of both plants broke down man-hours for various operations and provided exact figures on use of labor, space, and equipment, and on operating costs. As a result of this cooperation, the authors were able to study the efficiency of two well-operated milk plants through a firsthand survey.

For checking purposes 2 earlier reports have been used, one based on 6 Connecticut plants and one on 4 Washington plants. Figures on man-hours and on operating costs taken from these studies highlight those obtained from plants X and Y.

Since this study aims to provide practical aid as well as to assemble and analyze pertinent statistics, space is provided in tables 2, 3, 5, and 6 where plant owners and managers may record their own figures on plant operations and thus locate their weaknesses by comparing their figures with those for plants X and Y.

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[4] In 1943 the senior author assembled unit costs of milk-plant operation for over 1,000 milk plants operated by approximately 700 different companies. Some 200 of these costs were found to be reasonably comparable. A breakdown and analysis of the costs for each plant showed that the most efficient plants were those which operated a 100-percent wholesale business and sold milk exclusively in paper containers. See The Milk Industry, by R. W. Bartlett, pp. 46–49 and 265–269.

CHANGES AFFECTING THE DISTRIBUTION OF MILK

With the widespread distribution of milk supplies, often to places remote from the milkshed, and with the rapid urbanization of our country, milk distribution is no longer a simple matter. It is complicated by problems in transportation, in processing, in store sales, in bottling and packaging, and in meeting trade barriers. Some problems, especially those involved in attaining maximum efficiency of milk-plant operation, have not been wholly solved. Others have been so well met that in Illinois and many other States rapid changes are occurring in the processing and distribution of milk.

Widespread growth of improved roads: Milk transportation has evolved through the milk wagon and the milk train to the milk truck. Trucks require good roads. During the past 30 years, Illinois has made much progress in building all-weather roads capable of holding up trucks.

Increase distribution of milk through stores: During the past 25 years, the proportion of store sales to total sales of milk has increased greatly. By 1930, 30 percent of the total milk sales in the United States was through stores; by 1950, 45 percent. In some large markets such as New York, Chicago, and Los Angeles, store sales are now over 60 percent of total milk sales.

The shift from home delivery to store sales has frequently been accompanied by a rapid increase in per capita sales. In Chicago, for instance, the per capita sales in 1950 average 0.77 pint daily, as compared with 0.54 pint in 1934. Lower store prices and quantity discounts, along with an increased consumer income, were among the factors causing this 43-percent increase in the per capita sales of milk.[5]

Increased use of paper containers: The increase in use of the single-service container has contributed to the expansion of store sales. According to information compiled by the Pure-Pak division of Ex-Cell-O Corp., 71 percent of the milk sold throughout the United States by grocery stores in 1950 was packaged in paper containers.[6] Only 29 percent was packaged in glass bottles. Studies made in California showed that 85 percent of all milk sold through stores in 1945 in that State was sold in fiber containers.[7]

The use of paper containers for milk has increased greatly since 1940. According to recent studies, 4.8 percent of all milk sold in villages and cities in 1940 was packaged in paper containers.[8] By 1950 this percentage had increased to 31.2.

The use of single-service containers is rapidly widening the area in which milk can be economically distributed from one plant. Several Illinois dealers are regularly distributing milk in paper containers to many markets located as far as 200 miles from the bottling plant. As a result of widening of marketing areas, no local market in Illinois is free from either actual or potential competition from milk produced or bottled outside its local milkshed. For example, the Champaign-Urbana market, which formerly received all of its milk from local producers, is now regularly receiving milk packaged in paper containers from Bloomington, Chicago, Danville, Peoria, and Taylorville. This change has come about since 1948.

Action of the courts in breaking down trade barriers: In the past, many municipalities have enacted sanitary ordinances which have acted to prevent intermarket shipments of milk. The city of Waukegan, for example, had a comprehensive milk ordinance requiring that all milk sold in the city, except during emergencies, be produced and pasteurized in Lake County. Such an ordinance, even when intended as a health measure, frequently becomes a trade barrier protecting local dealers and farmers and preventing the benefits of free competition to consumers.

In three specific markets, including Waukegan, dealers wanting more efficient distribution of milk have brought cases before the courts of Illinois. In deciding these cases, the Illinois Supreme Court has upheld the legality of intermarket shipments of milk.

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[5] Based upon data obtained from the Chicago Federal milk market administrator.
[6] Letter from George Scott, vice president in charge of Pure-Pak sales, July 31, 1951.
[7] Blackburn, R. W., Streamlining Plant Operations and Store Distribution of Milk. Dairy Marketing Conference, University of Illinois, January 28, 1947. AE2443, p. 24 (mimeo.).
[8] Data compiled by an executive of the Borden Co., New York, and published in 1951 by the Pure-Pak division of the Ex-Cell-O Corp. (Detroit).

MAJOR FACTORS AFFECTING EFFICIENCY IN MARKET-MILK PLANTS

Analysis of the use of labor, space, electric power, and steam power by specific plants indicates two facts of major importance: (1) Efficiency in the use of labor tends to increase as volume increases, and (2) volume alone is not a dependable measure of efficiency.

That labor requirements tended to decrease as volume increased was brought out by a comparison of plants X and Y and 4 Washington and 6 Connecticut plants (table 1). Plant X handled 12,750 gallons of milk daily, over 200 times the volume of the Connecticut plant designated A. The unit requirements of man-minutes (86 per 100 gallons) for plant X were only one-sixth those of the Conecticut plant.

TABLE 1.—*Labor, space, electric power, and heat requirements in 12 market-milk plants* [1]

Plant	Gallons of milk per day	Man-minutes per 100 gallons	Square feet of floor space per 100 gallons	Electric power (horsepower-hours) per 100 gallons	British thermal units [2] (1,000) per 100 gallons	Number of products handled
A	60	550	422	31.3	171.7	.....
B	100	420	321	25.4	156.0	.....
C	200	300	284	24.0	138.5	.....
D	400	270	286	16.4	139.0	.....
E	600	250	274	15.3	132.0	.....
F	1,200	200	220	12.4	122.4	.....
G	2,452	193	283	.....	.....	14
Y	3,250	123	292	18.1	90.9	4
H	12,260	88	209	.....	.....	8
X	12,750	86	152	14.2	73.6	4
I	13,490	177	262	.....	.....	18
J	56,400	191	.....	.....	.....	41

[1] Data for plants A to F from Storrs Agricultural Experiment Station Bulletin 259, June 1948, p. 27; data for plants G, H, I, and J from The Milk Industry (Bartlett), p. 232; data for plants X and Y from plants used for detailed study. Plants A to F handled milk exclusively in glass containers and had both a wholesale and retail business. Plants G and I handled milk exclusively in glass and had a 100-percent retail business. Plants Y, H, and X handled milk exclusively in paper and had a 100-percent wholesale business. Plant I handled milk in both glass and paper containers and had both a wholesale and a retail business.

[2] British thermal unit (B. t. u.) is the amount of heat required to raise 1 pound of water 1° F.

Space requirements also tended to decrease as volume increased. Plant X used 152 square feet of floor space per 100 gallons of milk, or a little more than one-third the space required by plant A, 422 square feet.

The same situation existed for electric- and steam-power requirements Plant X used 14.2 horsepower-hours per 100 gallons of milk with a volume of 12,750 gallons per day. Plant Y required 18.1 horsepower-hours with a volume of 3,250 gallons of milk per day, while plant A, with the least volume of all the plants examined, 60 gallons of milk per day, used 31.3 horsepower-hours per 100 gallons.

Volume alone is not a dependable measure of efficiency. Plant X handled daily only one-fourth (12,750 gallons) of the volume handled daily by plant J in Washington (56,400 gallons), and yet plant X had less than half the unit labor requirements of plant J, which were 191 man-minutes per 100 gallons.

The lower unit labor requirements of plant X may be attributed in part to the following factors:

1. Plant X was constructed so that modern equipment could be arranged to make the most efficient use of labor. Plant J, however, as its business grew, had built one addition after another and had several different floor levels. It was almost impossible to arrange equipment in plant J so as to use labor efficiently.

2. Plant X handled only 4 items while plant J handled 41. Unit labor requirements tend to increase as the number of items handled increases.

3. Plant X handled milk only in paper containers. In contrast, plant J handled both glass and paper containers. Unless a plant is built expressly to handle both glass and paper containers, a combined operation frequently results in less efficient use of labor since it is difficult to integrate the 2 types of equipment and 2 kinds of activity.

Some plants use their space more efficiently than others with an equivalent or greater volume. Plant X, with about the same volume as plant I in Washington, used 40 percent less space per 100 gallons of milk than plant I. Plant Y, handling 3,250 gallons per day, was less economical in use of space than plant F in Connecticut. Plant F, with only three-eights of the volume of plant Y, used 25 percent less space per 100 gallons of milk than plant Y.

Although unit electric-power requirements were lower for plant X than for all 4 Washington plants and 5 of the Connecticut plants, they were slightly higher than for plant F. This is a departure from the trend for increasing volume to result in greater economy, for plant X handled about 10 times the volume of plant F.

Steam-power requirements, however, for all plants tended to decrease as volume increased.

The facts shown for labor space, and electric power coincide with those disclosed in other studies. One study showed that unit labor costs for one of the largest dealers in the market were 13-percent higher than the market average for store sales and 31 percent above the market average for home deliveries of milk.[9] Another study showed that distribution costs of 11 large distributors averaged 8-percent higher than those of all (117 dealers) included in this study.[10]

OPERATIONS OF PLANTS X AND Y

The plant manager who thinks his operating overhead is too high and wants to reduce it most determine which operations are being done efficiently and which are being done inefficiently. A simple inspection of his own plant is not enough and it may be difficult for him to visit other plants. Yet he needs a standard of comparison. Such a standard is presented here in the detailed study of each of the major operations of two north-central plants, plants X and Y. A plant manager can check his own operations against those of two very efficient plants.

How this works out is shown by two examples. A former student of the senior author used the efficiency standards of plant X in studying a Chicago dairy of similar size. Later he became superintendent of the plant. Knowing that the electric-power requirements were considerably higher than those of plant X, he hired an engineering firm to make a special study of how horsepower requirements in his plant could be reduced.

In another case, a plant manager used the standards set forth in this study as a basis for an analysis of his own plant. He later reported[11] what he had done to increase the efficiency of his dairy. First, finding that his transportation and receiving-station costs were too high, he closed a receiving station and rerouted his milk routes to eliminate unnecessary mileage. This made possible a 12-cent saving per 100 pounds of milk. Second, finding his cleanup costs out of line, he invited the company furnishing his chemicals to inspect his plant practices. He was able to reduce both material costs and labor costs. In conclusion, he pointed out that (1) old equipment used on the basis of depreciation rates, (2) awkward plant layouts, and (3) the packaging of too many items "can creep upon an operator and catch him eventually."

What these two men have done, any plant operator can do. Since plant X is extremely efficient, the most efficient of all when compared with the four Washington and six Connecticut plants, and plant Y is only slightly less efficient, an analysis of their operations can be helpful not only in analysis of other plants, but also in setting standards of efficiency for specific operations.

Labor requirements and labor costs

Plant X used an average of 859 man-minutes per 1,000 gallons of milk, and plant Y used 43-percent more, 1,228 man-minutes (table 2). Plant X was more efficient in use of labor than the four Washington and six Connecticut plants also (see table 1). Plant H came closest to plant X in number of man minutes used per 1,000 gallons of milk with 880. Plant A was at the other end of the scale, using 5,500 man-minutes per 1,000 gallons. This amount was over six times the unit labor requirements of plant X.

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[9] The Milk Industry, by R. W. Bartlett, p. 57.
[10] From Maine Agricultural Experiment Station Bulletin 451. 1947.
[11] Talk given at Dairy Marketing Conference, University of Illinois, February 7, 1951. AE2792, pp. 3–6 (mimeo.).

TABLE 2.—*Summary of daily labor and labor costs for plants X and Y*[1]

	Plant X	Plant Y	Your own plant
Receiving:			
Total man-minutes	676	411	
Man-minutes per 1,000 gallons	53.0	126.4	
Cost per hour	$1.46	$1.17	
Cost per 1,000 gallons	$1.29	$2.47	
Clarifying and filtering:			
Total man-minutes	265	17	
Man-minutes per 1,000 gallons	20.6	5.2	
Cost per hour	$1.46	$1.06	
Cost per 1,000 gallons	$0.51	$0.09	
Pasteurizing:			
Total man-minutes	2,286	713	
Man-minutes per 1,000 gallons	179.2	219.4	
Cost per hour	$1.54	$1.25	
Cost per 1,000 gallons	$4.59	$4.57	
Homogenizing:			
Total man-minutes	256	220	
Man-minutes per 1,000 gallons	20.2	67.6	
Cost per hour	$1.47	$1.20	
Cost per 1,000 gallons	$0.49	$1.35	
Bottling:			
Total man-minutes	3,591	973	
Man-minutes per 1,000 gallons	281.7	299.4	
Cost per hour	$1.48	$1.27	
Cost per 1,000 gallons	$6.97	$6.35	
Bottle-case cleaning and storage:			
Total man-minutes	811	77	
Man-minutes per 1,000 gallons	63.7	23.7	
Cost per hour	$1.31	$1.06	
Cost per 1,000 gallons	$1.39	$0.42	
Bottle-case filling and storage:			
Total man-minutes	3,070	1,581	
Man-minutes per 1,000 gallons	240.7	486.5	
Cost per hour	$1.38	$1.14	
Cost per 1,000 gallons	$5.53	$9.25	
Totals:			
Total time	10,955	3,992	
Man-minutes per 1,000 gallons	859	1,228	
Cost per hour	$1.45	$1.20	
Cost per 1,000 gallons	$20.76	[2] $27.44	
Cost per quart, cents	0.519	0.686	
Daily volume, gallons	12,750	3,250	

[1] From tables 8 through 17.
[2] Includes administrative costs in addition to direct costs. No data on hours of labor for administration were available.

Both plant X and plant Y received daily the amounts of milk needed for bottling operations. Plant X, however, received milk from tank trucks while milk came to plan Y in 10-gallon cans. Plan Y's unit labor requirements for receiving were more than double those of plant X.

The principal operation in which plant X proved more efficient in the use of labor than plant Y was in bottle-case filling and storage.[12] Plant Y used 486 man-minutes per 1,000 gallons in this operation, or about double the time used by plant X, 241 man-minutes (table 2). Plant X had a higher speed for bottling milk than plant Y. As a result, the employees worked faster and accomplished more than in plant Y. Plant X was likewise more efficient than plant Y in homogenizing milk, using less than one-third the unit labor requirements of plant Y.

Although both plants used the high-temperature short-time method of pasteurization, plant Y used 219 man-minutes per 1,000 gallons for pasteurizing milk, or 28 percent more than plant X.

Plant Y was more efficient than plant X in bottle-case cleaning and storage, using only three-eights as much labor and half as much space. Through a compact arrangement of its equipment, plant Y saved many steps for its employees.

Labor is the most costly factor in any milk plant, other than the cost of bottles and bottler rentals. In plant X, labor ran $20.76 per 1,000 gallons, or 28.8 percent of total plant outlay and 72 percent of costs other than those for bottles and bottler rentals.

[12] Officials of plant X are now working on a method by which cases will be packed by machinery in order to eliminate labor for this operation.

In most markets milk dealers pay the prevailing wage rates for different types of work, so an individual company has little control over the rate paid. In the market where plant X was located, for example, the wage rate was materially higher than that where plant Y was located. Plant X paid an average rate of $1.45 per hour, while plant Y averaged $1.20 per hour. Though plant X had a higher wage rate than plant Y, its unit cost for labor was 24 percent less than that of plant Y.

A manager who makes a careful analysis of every operation in his plant will generally find that he can reduce labor costs.

Space requirements and space costs

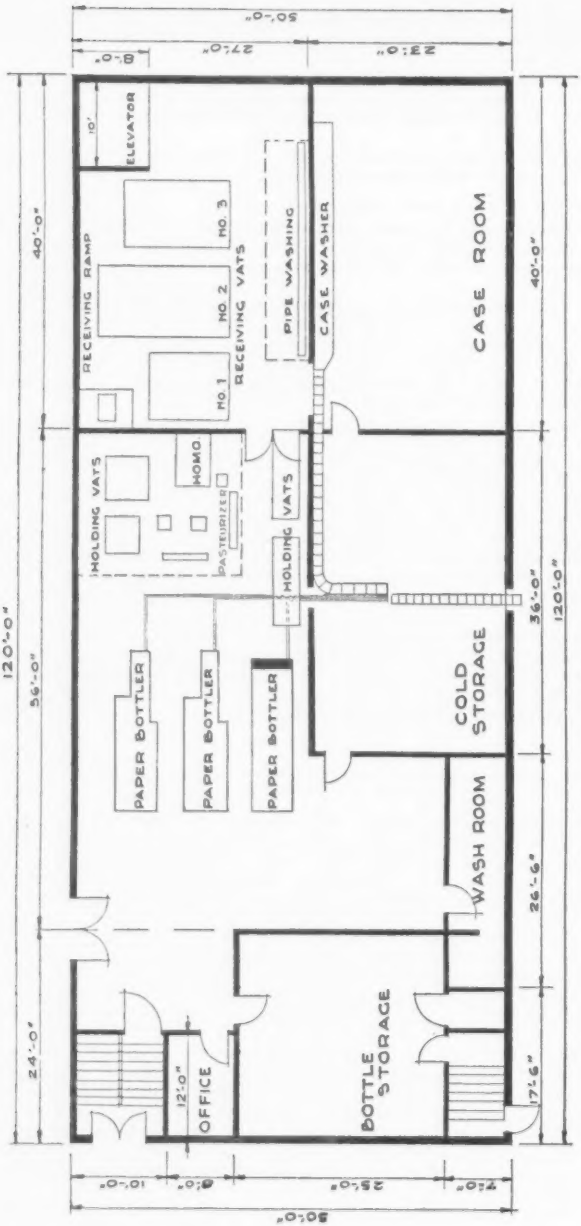
Efficient use of space in a milk plant means a lower unit cost of capital investment both in building and equipment, more efficient use of machinery through greater concentration, and a saving of man-hours because of convenient working conditions.

Plant X operated two shifts of 8 hours daily. A third shift came at night for clean-up operations. With this concentrated labor force, plant X used its floor space very efficiently, averaging 682 square feet per 1,000 gallons of milk daily, or about half the space requirements of plant Y, which were 1,334 square feet (table 3). Only 2 of the 10 Washington and Connecticut plants used more space per 1,000 gallons than plant Y.

By piping its milk directly from tank trucks, plant X also made substantial savings in the space required for receiving milk. Its unit space requirements for this operation were about one-fourth those of plant Y, where space was needed for receiving and storing milk cans.

In bottle-case filling and storage, the working of two shifts resulted in substantial space savings for plant X. Not only could 2 men use the space normally used by 1, but twice the number of bottle cases could be filled and stored. Through this efficient use of space and labor, plant X was able to take care of its bottle-case filling and storage at the rate of 85 square feet of floor space per 1,000 gallons of milk daily, or about one-third the rate for plant Y (266 square feet).

Plant Y, however, was more efficient than plant X in its use of space for bottle-case cleaning and storage and for bottling. Plant Y used 39 square feet of space per 1,000 gallons of milk daily for bottle-case cleaning and storage, or about half as much as plant X (81 square feet). Plant X used 21 square feet more per 1,000 gallons for bottling than plant Y.



Layout of the main floor of Plant X. (Fig. 1)

Layout of the basement of Plant X. (Fig. 2)

TABLE 3.—*Summary of space and space costs* [1]

	Plant X	Plant Y	Your own plant
Receiving:			
Total square feet	976	846	
Square feet per 1,000 gallons handled daily	76.5	260.3	
Cost per 1,000 square feet	$2.688	$2.560	
Cost per 1,000 gallons	$0.206	$0.666	
Clarifying and filtering:			
Total square feet	317	48	
Square feet per 1,000 gallons handled daily	24.9	14.8	
Cost per 1,000 square feet	$2.688	$2.560	
Cost per 1,000 gallons	$0.067	$0.038	
Pasteurizing:			
Total square feet	1,435	1,412	
Square feet per 1,000 gallons handled daily	112.5	434.4	
Cost per 1,000 square feet	$2.688	$2.560	
Cost per 1,000 gallons	$0.303	$1.112	
Homogenizing:			
Total square feet	168	166	
Square feet per 1,000 gallons handled daily	13.2	51.1	
Cost per 1,000 square feet	$2.688	$2.560	
Cost per 1,000 gallons	$0.035	$0.131	
Bottling:			
Total square feet	3,684	870	
Square feet per 1,000 gallons handled daily	288.9	267.6	
Cost per 1,000 square feet	$2.688	$2.560	
Cost per 1,000 gallons	$0.776	$0.685	
Bottle-case cleaning and storage:			
Total square feet	1,035	128	
Square feet per 1,000 gallons handled daily	81.2	39.4	
Cost per 1,000 square feet	$2.688	$2.560	
Cost per 1,000 gallons	$0.218	$0.101	
Bottle-case filling and storage:			
Total square feet	1,082	866	
Square feet per 1,000 gallons handled daily	84.9	266.4	
Cost per 1,000 square feet	$2.688	$2.560	
Cost per 1,000 gallons	$0.228	$0.682	
Totals:			
Total investment	$65,740	$38,150	
Total floor space (adjusted) square feet	8,697	4,336	
Floor space (adjusted) per 1,000 gallons handled daily, square feet	682	1,334	
Daily cost per 1,000 square feet	$2.69	$2.56	
Cost per 1,000 gallons handled daily	$1.83	$3.42	
Cost per quart, cents	0.0457	0.0855	

[1] From tables 18 to 24.

Plant X had a total of 11,948 square feet (adjusted) of space of which 8,697 square feet were used in plant operations and 3,251 square feet for selling and delivery. The total cost of space for plant operations averaged $23.38 per day. This averaged $1.83 per 1,000 gallons of milk, or 0.0457 cents per quart (table 3).

Space costs per 1,000 gallons for plant X were about half those for plant Y. Plant X handled about four times the volume of plant Y in twice the area; unit-space costs per 1,000 square feet were about the same for the two plants.

From the standpoint of overall operations, space costs for both plants X and Y were very low, plant Y averaging less than one-tenth cent per quart, while plant X averaged about one-twentieth cent per quart.

Equipment costs

Under usual circumstances, plants handling a large volume of milk and having a good plant layout are able to use their equipment much more efficiently than plants with a small volume. Unit-equipment costs for plant X of $2.69 per 1,000 gallons were only about two-fifths of those for plant Y, $6.90 per 1,000 gallons (table 4).

Plant X was far more successful than plant Y in holding down its unit-equipment cost for pasteurizing milk. Its unit expenditure for pasteurizing was only about one-fourth that of plant Y. In handling refrigeration costs, plant X was also more efficient, its unit cost being about one-third that of plant Y. An underlying cause for the greater efficiency of plant X in pasteurizing and refrigeration was the larger volume handled.

TABLE 4.—*Elements of equipment costs per 1,000 gallons* [1]

	Plant X	Plant Y
Intermediate processes:		
Steam power	$0.125	$0.320
Refrigeration	.329	.902
Sweet-water system	.064	.449
Wash tank	.021	.055
Surge tank	.044	.298
Pressure-vacuum system	.038	.074
Sanitary pipe	.060	.049
Direct to principal processes:		
Receiving	.445	.554
Clarifying and filtering	.276	.098
Pasteurizing	.662	2.376
Homogenizing	.191	.662
Bottling	.438	1.067
Total	2.693	6.904

[1] From table 28.

In use of equipment for bottling, plant X was again more efficient. With its large volume and two working shifts, plant X could use its bottling equipment more hours per day. As a result, the unit cost for plant X was less than one-half that of plant Y. Plant X in 1946 was operating its equipment two shifts a day, while plant Y needed less than one full shift to receive, process, and store its milk.

After this study was made, big increases in sales of milk in paper containers forced officials of plant X to build a larger plant. In 1951 the new plant was handling 225 percent of the volume of milk handled by plant X in 1946. The new plant was using labor and equipment even more efficiently than plant X was in 1946. Volume of plant Y was only slightly higher in 1951 than in 1946.

Electric-power requirements and power costs

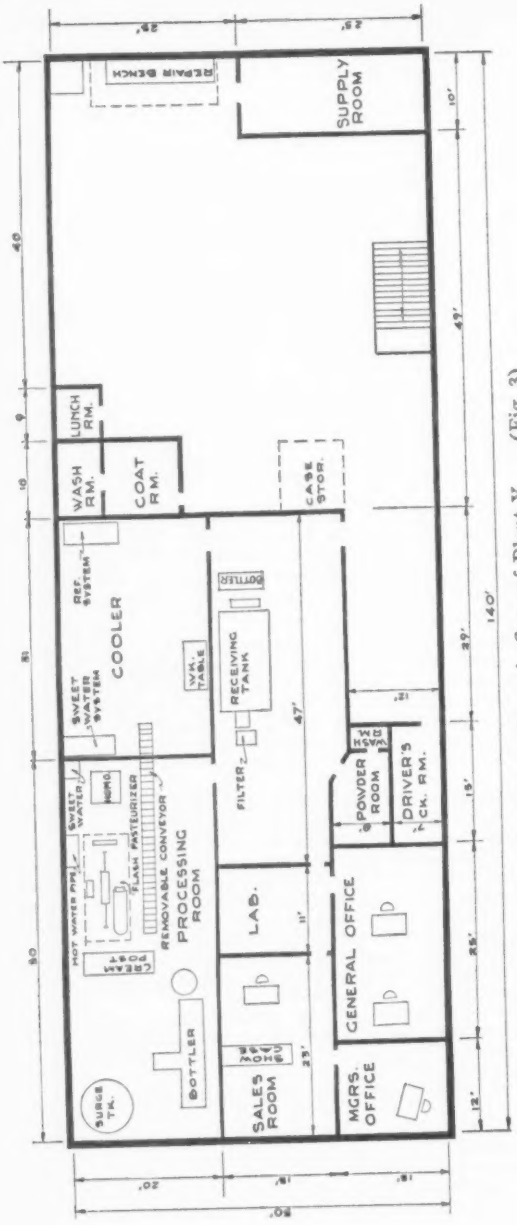
Since electric power is now used for most market-milk operations needing power, electric costs must be considered in any program aimed at efficiency. Plant X had 19 electric motors with a total of 124.75 rated horsepower while plant Y had 14 electric motors with a total of 69.75 rated horsepower.

Plant X used a total of 1,805 horsepower-hours (rated horsepower times actual hours of operation) daily, compared with 588 horsepower-hours used by plant Y (table 5). In both plants refrigeration and homegenizing required the most power.

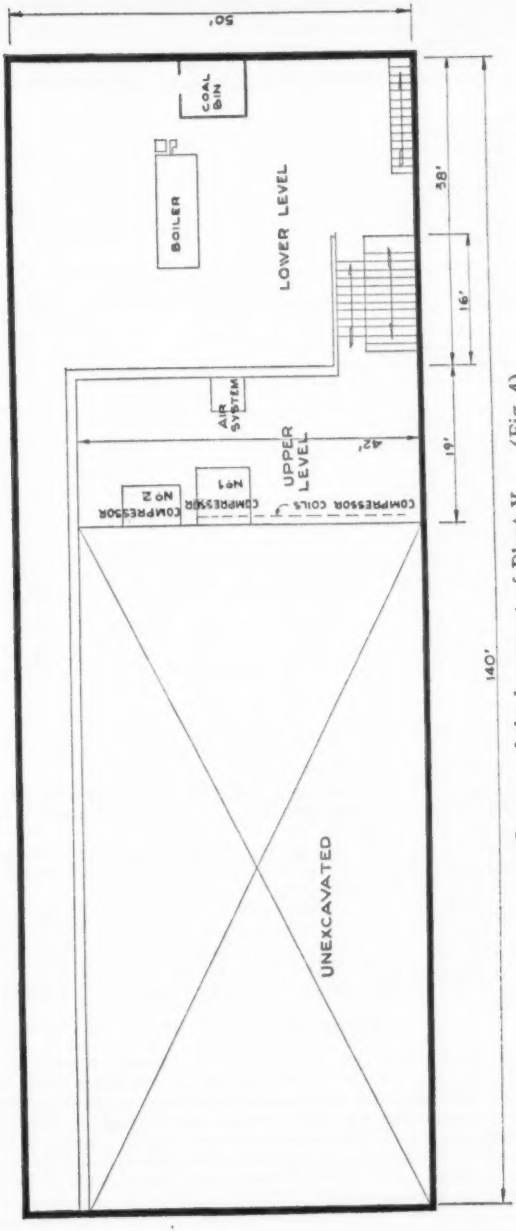
Plant X employed power more efficiently than plant Y. It averaged 142 horsepower-hours per 1,000 gallons of milk compared with 181 hours per 1,000 gallons for plant Y. The major difference in the relative efficiency of the two plants was in the use of electricity for refrigeration. Plant X used 92.9 horsepower-hours per 1,000 gallons. Plant Y with 126.8 horsepower-hours required 36 percent more power per 1,000 gallons than plant X (table 28). The refrigeration plant of plant X was operated more nearly to capacity than that of plant Y.

Plant X was also favored with a lower unit cost for electricity than that paid by plant Y. Plant X paid $4.759 per 1,000 horsepower-hours compared with $9.602 per 1,000 hours paid by plant Y. Plant X had a special commercial rate for power because of the large volume used.

As a result of a combination of more efficient use of power and a lower rate, plant X had average electricity costs of $0.674 per 1,000 gallons of milk compared with $1.738 for plant Y.



Layout of the main floor of Plant Y. (Fig. 3)



Layout of the basement of Plant Y. (Fig. 4)

TABLE 5.—*Summary of electric power and electric-power costs* [1]

	Plant X	Plant Y	Your own plant
Receiving:			
Total horsepower-hours	5.57	22.61	
Horsepower-hours per 1,000 gallons	.44	6.96	
Cost per 1,000 horsepower-hours	$4.76	$9.60	
Cost per 1,000 gallons	$0.0021	$0.068	
Clarifying and filtering:			
Total horsepower-hours	94.71	0.05	
Horsepower-hours per 1,000 gallons	7.42	0.016	
Cost per 1,000 horsepower-hours	$4.70	$9.60	
Cost per 1,000 gallons	$0.034	$0.0001	
Pasteurizing:			
Total horsepower-hours	1,238.34	405.78	
Horsepower-hours per 1,000 gallons	97.12	124.86	
Cost per 1,000 horsepower-hours	$4.76	$9.60	
Cost per 1,000 gallons	$0.462	$1.198	
Homogenizing:			
Total horsepower-hours	233.19	62.85	
Horsepower-hours per 1,000 gallons	18.29	19.34	
Cost per 1,000 horsepower-hours	$4.76	$9.60	
Cost per 1,000 gallons	$0.0871	$0.1860	
Bottling:			
Total horsepower-hours	180.78	47.53	
Horsepower-hours per 1,000 gallons	14.19	14.62	
Cost per 1,000 horsepower-hours	$4.76	$9.60	
Cost per 1,000 gallons	$0.067	$0.140	
Bottle-case cleaning and storage:			
Total horsepower-hours	1.14	0.18	
Horsepower-hours per 1,000 gallons	0.089	0.055	
Cost per 1,000 horsepower-hours	$4.76	$9.60	
Cost per 1,000 gallons	$0.0004	$0.0005	
Bottle-case filling and storage:			
Total horsepower-hours	50.90	47.80	
Horsepower-hours per 1,000 gallons	3.96	14.71	
Cost per 1,000 horsepower-hours	$4.76	$9.60	
Cost per 1,000 gallons	$0.019	$0.141	
Totals:			
Total horsepower-hours	1,804.63	[2] 588.39	
Horsepower-hours per 1,000 gallons	142	181	
Cost per 1,000 horsepower-hours	$4.759	$9.602	
Cost per 1,000 gallons	$0.67	$1.74	
Cost per quart, cents	0.0168	0.0435	

[1] From tables 26 and 27.
[2] Includes 1.59 horsepower-hours going to selling and delivery.

Steam-power requirements and steam costs

Plant X averaged 736 B. t. u. per gallon of milk compared with 831 B. t. u. for plant Y (table 6). The unit steam-power requirements for plant Y were 13 percent higher than those for plant X.

Plant X used oil for heat and had an automatic oil burner, while plant Y used coal. Plant Y's steam-power cost was $3.97 per million B. t. u., or more than 2½ times that for plant X ($1.48 per million B. t. u.).

With less heat used and with a lower unit cost, plant X's steam-power cost of $1.09 per 1,000 gallons of milk was considerably less than one-third that of plant Y ($3.61 per 1,000 gallons). Plant Y used more than double the amount of unit heat for receiving that plant X used. Plant Y, as stated, received milk in cans while plant X received milk in tanks. More steam was required for washing cans than for cleaning tanks.

SUMMARY AND CONCLUSIONS

Milk-plant operators are being forced to adjust their business operations to changes brought about by large-volume operations resulting from intermarket shipments of milk and increased store sales of milk in paper containers. These adjustments have emphasized the need for greater efficiency in the industry.

To find out what constituted efficiency in the use of labor, space, electric power, and steam power for the operations of market-milk plants, and how to measure it, an analysis was made in 1946. Two efficient milk plants, plant X in Illinois and plant Y in Minnesota, were studied in detail, and data from several other plants were used for comparison. The study indicated that the greatest opportunities for improving milk-plant efficiency appeared to lie in: first, increasing volume; second, modernizing the layout of the plant; third, introducing modern equipment; and, fourth, limiting the number of products handled.

TABLE 6.—*Summary of steam power and steam-power costs* [1]

	Plant X	Plant Y	Your own plant
Receiving:			
Total B. t. u. (1,000's) daily	796	477	
B. t. u. per gallon	62.4	146.7	
Cost per 1,000 B. t. u	$0.00148	$0.00397	
Cost per 1,000 gallons	$0.092	$0.582	
Clarifying and filtering:			
Total B. t. u. (1,000's) daily	162	19	
B. t. u. per gallon	12.7	5.8	
Cost per 1,000 B. t. u	$0.00148	$0.00397	
Cost per 1,000 gallons	$0.019	$0.023	
Pasteurizing:			
Total B. t. u. (1,000's) daily	6,180	1,665	
B. t. u. per gallon	484.7	512.3	
Cost per 1,000 B. t. u	$0.00148	$0.00397	
Cost per 1,000 gallons	$0.717	$2.034	
Homogenizing:			
Total B. t. u. (1,000's) daily	160	107	
B. t. u. per gallon	12.5	32.9	
Cost per 1,000 B. t. u	$0.00148	$0.00397	
Cost per 1,000 gallons	$0.018	$0.131	
Bottling:			
Total B. t. u. (1,000's) daily	1,644	381	
B. t. u. per gallon	129	117.2	
Cost per 1,000 B. t. u	$0.00148	$0.00397	
Cost per 1,000 gallons	$0.191	$0.465	
Bottle-case cleaning and storage:			
Total B. t. u. (1,000's) daily	441	53	
B. t. u. per gallon	34.6	16.3	
Cost per 1,000 B. t. u	$0.00148	$0.00397	
Cost per 1,000 gallons	$0.051	$0.065	
Totals:			
Total B. t. u. (1,000's) daily	9,383	[2] 2,702	
B. t. u. per gallon	736	831	
Cost per million B. t. u	$1.48	$3.97	
Cost per 1,000 gallons	$1.09	$3.61	
Cost per quart, cents	0.0272	0.0902	

[1] From tables 32, 33, 34, and 35.
[2] This does not I nclude 251,000 British thermal units which were charged to selling and delivery.

Efficiency in the use of labor tends to increase as volume increases. This study indicates that a plant bottling 50,000 quarts of milk or more per day, if properly arranged and equipped with modern machinery, usually can operate more efficiently than a plant handling a smaller volume. This was the volume handled by plant X at the time of the study, while plant Y handled about a fourth as much. Unit space costs for plant X were slightly more than half those of plant Y and unit equipment costs about two-fifths those for plant Y.

Volume alone, however, is not a dependable measure of efficiency. One plant, plant J, handled more than 4 times as much milk as plant X, yet it used 1,910 man-minutes per 1,000 gallons of milk while plant X used only 859 man-minutes. One cause of the inefficient use of labor in plant J was the many items it handled, 41 compared with only 4 handled by plant X. Also it was practically impossible to arrange equipment properly in plant J's poor layout.

Labor is usually the most costly factor in any paper-container plant, other than the cost of containers and bottler rentals. In plant X labor was 29 percent of total plant costs and 72 percent of costs other than containers and bottler rentals; for plants Y the percentages were 29 and 64, respectively. Plant X was located in a market where wages were higher than in plant Y's area, and paid $1.45 an hour to Y's $1.20. But even though plant X paid higher wages, plant Y's unit labor cost was 32 percent higher than X's and its unit labor requirements 43 percent higher. The greater volume of milk handled by plant X underlay the difference in efficient use of labor in the two plants.

Space costs per unit are small in many milk plants. In plant X they averaged $1.83 per 1,000 gallons of milk, or about one-eleventh the cost of labor. In plant Y they averaged $3.42 or one-eighth the cost of labor. About half of the total saving in the use of floor space was in pasteurizing, where plant X used only about a fourth as much space per 1,000 gallons of milk as plant Y.

Unit costs of equipment are usually higher in plants handling only a small volume than in plants handling a larger volume. Thus in plant X equipment costs averaged $2.69 per 1,000 gallons, or about one-eighth the cost of labor, while

in plant Y costs were $6.90 or one-fourth the cost of labor. Plant X was far more efficient in pasteurizing milk, its unit cost being about one-fourth that of plant Y.

When, as at present, each machine has its own motor, a large plant has less advantage over a small plant in the use of power than it has in use of space and equipment. A large plant, however, may have a decided advantage over a smaller plant in the rate charged for electricity. Unit power requirements for plant X were about four-fifths those of plant Y, but because of its heavy use of electricity, plant X had an industrial rate of $4.759 per 1,000 horsepower-hours, or about half that of plant Y. As a result of somewhat greater efficiency and materially lower electric rates, plant X's cost for electricity, $0.674 per 1,000 gallons of milk, was only about two-fifths that of plant Y.

Many milk plants in the country have shifted from coal to oil in order to lower costs. High labor rates combined with increased coal prices have materially increased the costs of generating steam from coal. Plant X used an automatic oil burner for generating steam while plant Y used coal; plant X's cost of steam power per million B. t. u.'s was only two-fifths as much as plant Y's, and plant X's cost for steam per 1,000 gallons of milk was less than one-third as much.

Some plant layouts are very wasteful of manpower. Companies that have poor layouts and can afford to do so may find it good business to build new plants and equip them with modern machinery. Savings made in 2 or 3 years will often pay for the entire cost of new buildings. Plants that find it difficult to do this can often materially reduce costs through a carefully studied rearrangement of plant layout and the adoption of laborsaving techniques. Modernizing equipment, even without a new layout, will tend to promote greater efficiency.

The most efficient plants studied handled relatively few items, not more than 8 or 10. Some items are handled to hold particular outlets, even though at a loss. Under good management some of the unprofitable items can be eliminated.

Mr. BARTLETT. If you take a plant that has a high degree of inefficiency, and it may have no profit at all. We have two plants in a large city, the bigger plants, where they say if they can break even the smaller dealers can make money.

You cannot measure the efficiency of milk distribution on the profits a dealer makes. One handles 51,000 quarts a day and has 86 man-minutes per 100 gallons a day, another 6,000 quarts, and uses 200 man-minutes; and a third handles 60 gallons and has 550 man-minutes. I am using man-minutes as a measure of efficiency because labor is one of the most important factors.

The question of milk distribution today it seems to me is a question of efficiency in operation. On a unit basis this means low man-minutes, low horsepower-hours, low B. t. u.'s, and low space. Chicago had 187 bottling plants in 1946, 118 in 1952. They knocked off 69 in the past 6 years. I expect that this decrease in numbers will come rather rapidly during the next decade to most of the markets in the United States.

We have very inefficient milk distribution in many parts of the country today. I think that the trend that we have now toward larger volume per plant, and larger volume per route, and larger volume per store, is going to cut right across the board.

In a talk presented at Farm and Home Week at the University of Illinois on February 3, 1953, R. B. Bush, manager of Lucerne Milk Co., Safeway Stores, had as his subject: Economics of Vertical Integration of Bottling Plant, Transportation, and Store Sales of Milk.

A few highlights of his talk are—

(*a*) Keep plant costs low by handling a large volume per plant: The plant in Washington, D. C., handles an average of 88,000 quarts of milk daily and uses an average of 72 man-minutes per 100 gallons of milk.

(*b*) Have large-volume deliveries: The average daily volume per truck for Safeway Stores is 267 cases of 6,408 quarts. Peak-day loads run as high as 398 cases (9,552 quarts). The average daily delivery per store is 400 quarts, and on peak days many stores take over 2,400 quarts.

(*c*) Keep low the number of items handled: At the Washington plant, the company has only 10 items. Of these 4 are in quarts, regular homogenized milk, vitamin D homogenized milk, buttermilk, and chocolate drink; 1 in pints, half and half; 3 in half pints, table cream, whipping cream, and sour cream; and 2 in 12-ounce packages, cottage cheese, large curd, and small curd.

Mr. ANDRESEN. They have made some changes in distribution where they have deliveries every other day?

Mr. BARTLETT. That is right.

Mr. ANDRESEN. And no delivery on Sunday?

Mr. BARTLETT. That is right. This is for home deliveries which are becoming less important.

Mr. ANDRESEN. Of course, that cuts down the cost of operation.

Mr. BARTLETT. That was a move in the right direction but, of course, along with it we have had—there is no question—costs are higher than they were, particularly with more people buying milk at stores. Labor is one of the main factors. We have all costs of material being higher than they were.

Mr. ANDRESEN. I could never understand how some milk drivers in Chicago could make as much as $10,000 or $15,000 a year. Maybe you know something about that?

Mr. BARTLETT. Let's take that a minute and I will take that in relation to what has happened in Chicago.

There are only a very small number that get over $10,000 a year. Those are wholesale drivers that deliver large volumes per route. What that is predicated on is a contract that was made in the horse and buggy days when a driver could handle only a small volume.

The contract in Chicago—I have included in my book The Milk Industry (Ronald Press, p. 53); it is the same kind today—the higher your volume per route, the higher the unit payment to the driver.

As his load increases, the unit rate increases. The same thing is true in St. Louis. That, of course, is a crazy setup. Usually a higher volume calls for a lower unit rate. I think Mr. Bush, of the Safeway Stores, gave some information of their operations. His routes in Washington, D. C., from plant to stores, handle an average of 7,000 quarts per day per man per route. That is efficient operation. Most of these Chicago routes are handling far less volume. Some of these that get into those higher-paid brackets have bigger loads but are getting the rates they used to have with smaller loads. That is not a sound practice.

Here is a point that seems to be of interest. Any group, whether farmers, labor, or dealers may price themselves out of the market. I think there were 1,200 fewer drivers in 1940 than in 1930. As we get the trend from home delivery to store sales, the number of drivers gradually decreases.

Store sales in Chicago increased from 6 percent in 1930 to 70 percent of total milk sales in 1952. With that you have had a big decrease in the number of drivers.

The exaction of a high wage rate for wholesale drivers was made to prevent the expansion of store sales of milk. It did not prevent it but it was an effort to prevent it. Basically, in relation to sound economics, that high-wage rate has no substance whatsoever.

I would like to take at this point a discussion of No. 4 of my assumptions (exhibit I). Vendors who own their own trucks and buy bottled milk at the platform will gradually replace union drivers in all areas where wage rates exacted are materially above their competitive level.

I raise the question, Will vendors who own their own trucks displace union milk drivers?

The answer to this question would depend at least in part on the policy of labor unions.

In areas where the union wage scale is in line with the prevailing wage for labor in this type of work there will be less incentive to have vendors—and I might define a vendor. A vendor is a person who buys milk at the platform of a dealer and then distributes it where he wants to. He is an individual entrepeneur. After he bought the milk that is his own business.

To go back—in areas where the union wage scale is in line with wages for this type of work there will be less incentive to have vendors than in areas where the union wage is materially above that for similar types of labor.

In the latter case it may be expected that more and more milk will be sold to vendors at the platform of both link plants with an accompanying reduction in the number of union employees of dairy companies.

In a southern market 1 dealer handling over 60,000 quarts daily now operates a milk plant exclusively for vendors. He has no union drivers whatsoever. He sells all his milk at the platform. Part of these vendors distribute milk to homes while others serve wholesale stops.

There is another market which is very important. In this market union employees, hauling milk from a bottling plant to stores were recently entirely displaced by vendors. Picketing of the plant was immediately prohibited by a court order that was later upheld by the court of appeals and by the supreme court of this State.

This case is now before the United States Supreme Court. If the United States Supreme Court rules that that company has a right to use vendors, I think that this decision will be very influential and encourage vendors in all parts of the country where union wage rates are above what I would call the prevailing wage rate for men employed in that particular skill.

Mr. ANDRESEN. Dr. Bartlett, I do not want to divert, but our time is now getting short. There are two other things that I would like to touch on. One is the question of substitutes for dairy products. Have you done any work on that?

Mr. BARTLETT. Yes, a little. I have written one article on Is a 90 Percent Parity Price Desirable for Dairy Farmers? (Exhibit VIII.) Also I would like to include the report of a committee of 10 nutritionists on the subject, Butterfat Nutritional Research Committee as exhibit IX.

(The information is as follows:)

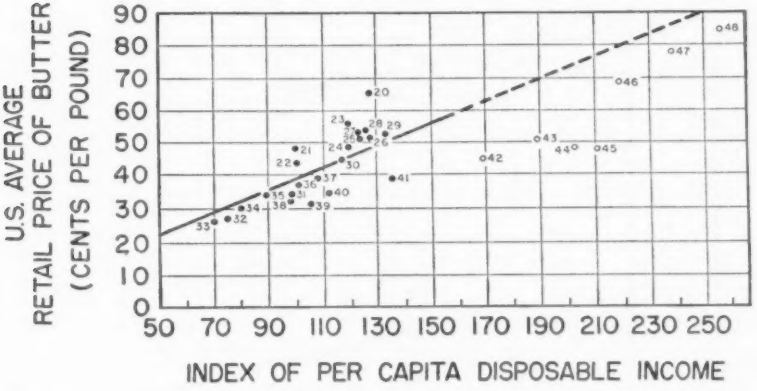
EXHIBIT VIII

[Illinois Farm Economics, February–March 1953]

IS A 90-PERCENT PARITY PRICE FOR BUTTER DESIRABLE FOR DAIRY FARMERS?

With some reluctance Secretary of Agriculture Benson has extended the 90-percent parity price for dairy products to March 31, 1954. With facts now avail-

FIG. 1. RELATION OF RETAIL PRICE OF BUTTER TO PER CAPITA DISPOSABLE INCOME, 1920-1948, UNITED STATES. SOURCE, IOWA FARM SCIENCE, VOL. 4, NO. 2, P. 14-30, AUGUST, 1949.



able one may well raise the question: Is a 90-percent parity price for butter desirable either from the immediate or the long-run viewpoint of dairy farmers? Specific facts which may well be considered in answering this question are: (1) Per capita sales of butter in the United States in 1952 were only 49 percent of those of 1922–26; (2) scientific studies have shown that, at a given level of income, consumers will pay less for butter than formerly; (3) during the past 30 years, retail butter prices have become increasingly higher as compared with margarine; (4) scientific studies summarized by Professor Childs, of the home economic department of the University of Illinois, have shown that "vegetable fats when supplemented with the fat soluble vitamins and when fed with the mixed diet commonly consumed by men, are nutritionally equivalent to butterfat." [1]

PER CAPITA SALES OF BUTTER HAVE DECLINED

Per capita sales of butter declined slowly from 1922 to 1942. Since 1943 they declined rapidly. During the period 1937–41, sales of butter averaged 16.6 pounds annually per person, or 7 percent less than for 1922–26 (17.8 pounds). During World War II, milk formerly used in butter was diverted to whole milk uses with the result that for 1943–45, per capita sales fell to 11.3 pounds, or about two-thirds of those of 1922–26. With the end of World War II, the downward trend in butter sales continued. In 1952, estimated sales were 8.7 pounds per person, or 49 percent of those in 1922–26. Why have butter sales declined?

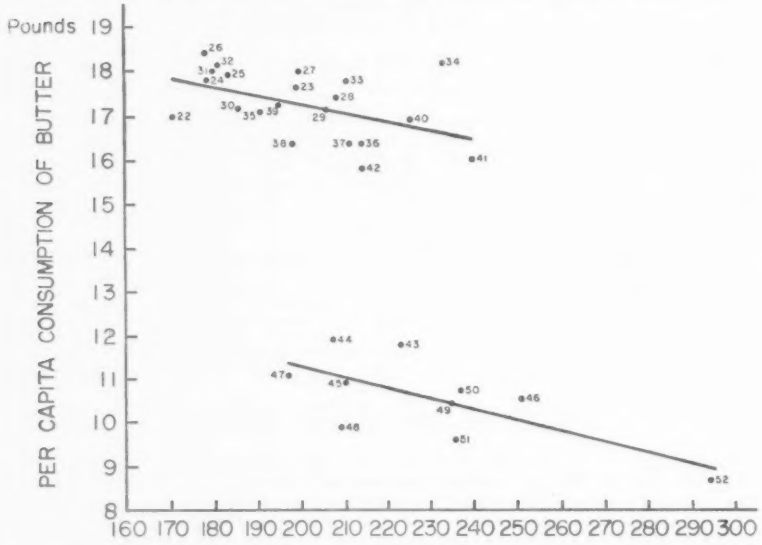
[1] Talk before the Dairy Store Conference, University of Illinois, December 10, 1952. Includes a summary of 19 scientific studies dealing with fats as related to nutrition. A copy may be obtained upon request to the Department of Agricultural Economics.

THE MARKET DEMAND FOR BUTTER HAS DECREASED

A recent study indicates that at a given level of consumer income consumers now are not willing to pay as much for butter as formerly. This study, by Prof. Geoffrey S. Shepherd, of Iowa State College, stated:[2] "* * * The price of butter was held down during the war as much as the price of meat was. However, when controls were ended butter prices remained relatively low. The dots (fig. 1) for

PERCENTAGE BUTTER PRICE WAS OF MARGARINE PRICE

FIG. 2. CHANGES IN THE BUTTER-MARGARINE RETAIL PRICE RATIO (BUREAU OF LABOR STATISTICS), AND PER CAPITA CONSUMPTION OF BUTTER. (U.S.D.A.)



1947 and 1948 lie below the income line—not above as with meat. This is even more surprising since butter consumption and supply was almost the smallest in history—about a third smaller than prewar. If butter supplies had been just average, butter prices would have been 15 or 20 cents lower. So, the demand for butter has dropped from prewar levels in relation to consumer income. This decline started in the 1920's. It has been more marked in the past few years * * *."

THE RATIO OF BUTTER-MARGARINE PRICES HAS WIDENED

Retail prices are now higher relative to margarine prices than formerly (table 1 and fig. 2). This is one cause of lower per capita sales of butter. From 1922 to 1926 the retail price of butter averaged 52.9 cents per pound or 82 percent more than the price of margarine (29.1 cents). During 1937 to 1941 the butter price averaged 114 percent above that of margarine.

From 1943 to 1952 the butter-margarine ratio widened even faster. Thus, from 1947 to 1951 the retail price of butter averaged 78.9 cents per pound, or 121 percent more than retail price of margarine (35.7 cents).

In 1952 butter prices averaged 86.1 cents or 194 percent higher than margarine (29.3 cents,[3] while per capita sales of butter were the lowest on record (fig. 2).

[2] Farm Science, Iowa State College, August 1949, p. 13.

[3] The margarine price does not reflect the numerous bargain prices which have been offered widely. In March 1953, in Champaign-Urbana for example, one could buy 2 pounds of a nationally advertised brand of margarine for the price of 1 pound plus 1 cent.

Another cause of low butter sales in 1951 and 1952 was repeal of taxes and license fees on margarine. In 1950 all Federal taxes of this type were removed. At that time 16 States with about two-fifths of the Nation's population also taxed the sale of colored margarine. Thirteen States have repealed these taxes. Iowa,[4] Minnesota, and Wisconsin, with about 6 percent of the Nation's population, are the only States which retain them.

HOW CAN THE GOVERNMENT DISPOSE OF LARGE QUANTITIES OF BUTTER?

High production of milk in the past 4 months[5] has forced the Government purchase of an unusually large volume of butter to sustain the wholesale price at 67.75 cents per pound. During this period the Government purchased 95 million pounds of butter, of which 69 million was purchased in January and February 1953. This volume compares with 114 million pounds purchased in the 12 months of 1938–39, 114 million pounds in 1949, and 128 million pounds purchased in 1950, the 3 years when Government purchases were the highest.

How much butter the Government will have to purchase to support the price at 90 percent of parity during the surplus months of April, May, and June is a matter of opinion. In its February 26, 1953, issue, the Wall Street Journal quoted an estimate of 500 million pounds. Whether this estimate is too high or too low, everyone familiar with the dairy industry is agreed that the Government is likely to be in the butter business in a big way during the next few months.

TABLE 1.—*Average retail price of butter and margarine, relationship between them, and per capita consumption of butter, United States, 1922–52*

Years	Average retail price			Per capita consumption of butter [2] (pounds)
	Butter [1] (cents/pound)	Margarine [1] (cents/pound)	Percentage butter was of margarine	
1922–26	52.9	29.1	182	17.8
1927–31	50.2	25.5	197	17.6
1932–36	32.5	15.9	205	17.5
1937–41	37.0	17.3	214	16.6
1942–46	54.3	24.4	222	12.2
1947–51	78.9	35.7	221	10.3
1952 [3]	[3] 86.1	29.3	294	8.7

[1] Retail Food Prices in Leading Cities of the United States, U. S. Department of Labor, Bureau of Labor Statistics.
[2] United States Department of Agriculture, Bureau of Agricultural Economics. Data for 1951 were preliminary and for 1952 were partly forecast.
[3] January through October.

How can the Government dispose of such large quantities of butter before it becomes rancid? In July 1950 the Government had 200 million pounds of butter in storage. A small part was given to school-lunch programs and relief agencies. In 1950 some was sold abroad at about one-fourth the purchase price. The Korean war, beginning in June 1950, resulted in higher prices and enabled the Government to sell the remainder to dealers on the open market.

Substitution of butter for margarine by the military forces is one possible outlet. In 1952, the Army Quartermaster Corps purchased 38 million pounds. Assuming that each of some 4 million in the military forces consumes 25 pounds, this would use a total of 100 million pounds or about the amount now in storage.

Another suggestion for using surplus butter is the initiation of 1 cent sales in which a pound of Government butter be given to American consumers with the sale of each pound of commercial butter plus a cent. Summed up, the potential outlets for Government butter whether through school-lunch programs, relief, disposal to Armed Forces, exports, or as gifts to American Consumers, means a costly program of governmental subsidization.

[4] A bill to repeal margarine taxes is before the Iowa Legislature.
[5] Milk production in 26 Federal order markets in December 1952 averaged 16 percent larger than December a year ago. Milk production in the Chicago milkshed in December 1952 and January 1953 was 19 percent above that of a year earlier. For the same periods production in the St. Louis market was up 22 percent, and in the Davenport-Rock Island milkshed 48 percent.

WHAT ABOUT FUTURE POLICY RELATIVE TO PARITY PRICES OF BUTTER

Questions which might well be raised are: In view of relatively high retail prices of butter, decreased demand, and powerful competition of vegetable fat substitutes, is it either to the immediate or long-run interest of the dairy industry to maintain 90 percent of parity prices, or is such a policy likely to result in further loss of the butter market to margarine? Will the present butter program prove to be another fiasco like potatoes which cost the Government about $450 million, resulted in a huge overproduction, and finally in requests from potato growers to discontinue the program?

While confronted with serious problems of adjustment the present situation is not critical for dairy farmers. In the first place consumer income in the United States is at a very high level, averaging $1,494 per person, or nearly 3 times that for 1935–39 ($513). When corrected for changes in purchasing power American consumers in 1952 had $1.53 for each dollar in the prewar years. In the second place, butter is no longer as dominant a price-making force as formerly. In 1952 only 25 percent of the milk produced in the country was manufactured into butter, as compared with 41 percent in 1939. Finally, probable increases in population combined with higher per capita sales of market milk, cheese, and dried whole milk, are likely to more than offset losses in per capita sales of butter. In a recent paper the writer estimated that a production of 134.7 billion pounds of milk will be needed to supply the needs of American consumers in 1960, or 9 percent more than the 1950 production.[6] The dairy industry is a going concern and likely to continue so for a long time.

R. W. BARTLETT.

EXHIBIT IX

REPORT OF BUTTERFAT NUTRITIONAL RESEARCH CONFERENCE HELD MAY 14–15, 1953, EDGEWATER BEACH HOTEL, CHICAGO—CALLED BY AMERICAN DAIRY ASSOCIATION

ATTENDANCE

Advisory scientists: Dr. C. A. Elvehjem, University of Wisconsin; Dr. Elmer Stotz, Rochester University Medical School (New York); Dr. Tom Hamilton, University of Illinois; Dr. H. L. Sipple, Nutrition Foundation, New York City; Dr. George Holm, dairy products research, United States Department of Agriculture; Dr. Zoe Anderson, National Dairy Council; Dr. T. W. Gullickson, University of Minnesota; Dr. Irvin E. Liener, University of Minnesota; Dr. H. H. Williams, Cornell University; Dr. Ancel Keys, University of Minnesota.

ADA research members: Dr. J. A. Nelson, dairy industry head, Montana State College; Dr. Frank E. Rice, executive secretary, Evaporated Milk Association; Dr. B. W. Fairbanks, executive director, American Dry Milk Institute; Harry E. Dodge, Kansas, chairman ADA research.

GENERAL OBSERVATIONS

This advisory group of 10 selected scientists came up with (1) some sobering answers and, (2) a list of 18 suggested scientific approaches.

At various times throughout the 2-day conference, each of the 10 scientists made statements on the practical aspects of the role of research in establishing nutritional differences between butterfat and other edible fats. In summary, the points of agreement included:

1. Butterfat is an excellent and attractive food which has an important place in the American diet.
2. Outlook is not bright for finding new, significant factors of special nutritional value in butterfat during the immediate future.
3. Discoveries of new nutritional factors offer the opportunity that they may be reproduced synthetically and added to competitive products.
4. Projects should be on a longtime basis (5-year plan). Meaningful results may occur at intermediate intervals.
5. There are few, if any, "quickies" in sight that would be profitable research investments.

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[6] Paper before the Dairy Marketing Conference, University of Illinois, February 3, 1953. A copy may be obtained upon request.

6. In the light of what now appears on the research horizon, butterfat will do well to hold its own from the nutritional standpoint.
7. Research at best is a gamble.
8. There is frequently a delay between research results and the benefits to be derived. It may take 10 years to realize benefits from today's research results.
9. Research to answer specific problems is generally difficult to initiate.
10. Nutrition experiments with human beings as subjects present complex problems. They are not easy to control, involve many variable factors, take longer periods of time to develop interpretable results.
11. Whereas with small animal experimentation, promising leads can often be uncovered for followup with human studies. It is also possible to do life-span and multiple-generation studies in comparatively short periods with laboratory animals.
12. There is urgent need for more research to advance the knowledge of fat metabolism. What is the fate of fats in the human body?
13. Industry and researchers will benefit most if additional projects are integrated with those already underway.
14. There are laboratories now working on fat metabolism that could divert part of their efforts to butterfat studies.
15. It is recommended that projects be limited in number, comprehensive, well planned, and placed at institutions having adequate equipment plus specially qualified personnel.
16. It would be scientifically difficult to prove greater stability of natural vitamin A under normal conditions of holding. Vitamin A in very large quantities, whether natural or synthetic, has toxic qualities. Further, it is known that there is no great danger of vitamin A deficiency in the American diet.
17. It is possible that vitamins added without natural protective substances are more readily destroyed by heat, as in cooking and baking, than are natural vitamins. The effects of oxidation on synthetic and natural vitamins offers a fertile field for investigation.
18. The role of fat in the development of fatty livers has not been clearly established. This is a fertile field for continued investigation.

SPECIFIC APPROACHES

Worked out on assignment Thursday evening, specific approaches were presented Friday morning by Dr. Ancel Keys, University of Minnesota, on human studies, by Dr. C. A. Elvehjem, University of Wisconsin, on small animal experimentation, and by Dr. Elmer Stotz, Rochester University Medical School, on "test tube" chemical studies. It should be noted that these reports were the result of collective as well as individual efforts.

Of the list of approaches suggested at the conference, the ADA "sifting" committee selected the following and requested the ADA research director to follow through by personal contact with Elvehjem, Keys, and Stotz. Here is the basic list with titles and descriptions in abbreviated form:

Human studies (Dr. Ancel Keys):
1. Cooperation with groups working on "red boy" (kwashiorkor)
2. Restoration and rehabilitation of children from malnutrition
3. Cholesterol studies with adults (continue and expand)
4. Statistical population studies of dietary habits and health
5. Controlled studies (with man) of diets high in pure vegetable fats compared to those high in butterfat
6. Specific fats added to low fat diets (blood chemistry)
7. Use of butterfat in reducing diets

Animal studies (Dr. C. A. Elvehjem):
1. The relative nutritional value of butterfat and vegetable fats when fed in diets high in lactose, especially the relation of unsaturated fatty acids and vitamin E
2. Effects of fats on utilization of other nutrients
3. Effects of protein-fat ratios on tissue changes
4. Quantity and quality of fats fed under stress conditions
5. Relationship of dietary fats to longevity
6. Does fat (butterfat) supply certain factors necessary for successful reproduction and lactation?

Test-tube studies (Dr. Elmer Stotz):
1. Effects of heat on nutrients in butterfat and other fats

2. Use of new techniques in determining unique characteristics of butterfat
3. Sitosterols in vegetable fats
4. Extensive investigations of lipoproteins

Additional human studies (Dr. Zoe Anderson):

1. Absorption and utilization of fats in children (normal and diseased)

Mr. ANDRESEN. That was the next question I was going to ask you. In Illinois you permit—I say "you"—they permit the sale of filled milk.

Can you tell us about that, and what effect that is having on the producers?

Mr. BARTLETT. Filled milk, if I interpret what you mean, Mr. Andresen, is milk from which the cream has been taken away and a vegetable substitute added.

Mr. ANDRESEN. That is right.

Mr. BARTLETT. We have in Illinois one plant that produces Milnut, at Litchfield. Rather than answer particularly for Illinois, I would rather answer it from the viewpoint of the United States. Evaporated and condensed milk per capita sales have gone down from 20 in pounds per person in 1950 to 17.9 pounds in 1952.

The price of filled evaporated milk usually is 2 to 3 or 4 cents per can less than for evaporated milk.

I trade at the Eisner grocery stores in Champaign and Urbana. When filled milk was 11, evaporated was 14 or 15. I think evaporated has dropped. The main problem in that substitute—I am looking ahead—is that this Milnut, the vegetable substitute, certainly should not masquerade as a dairy product.

Of course butter per capita sales have gone down. I just noticed in Minnesota that the per capita sales of butter in Minneapolis, were 34.8 pounds in 1938, and 20.8 in 1952. That is an article by Professor Cox, of the University of Minnesota.

Mr. ANDRESEN. Of course we do not allow yellow-colored oleo to be sold in Minnesota.

Mr. BARTLETT. That is true. On the other hand, per capita sales of oleo have increased faster in Minneapolis than in the United States as a whole.

It increased from 0.5 pounds in 1938 to 6.8 in 1952, and in the United States it went from 2 pounds to 7.7 in the same period. It increased just about the same rate. Even with your law prohibiting the coloring of oleo.

Minnesota and Wisconsin—I do not know what happened in Iowa—there are only three States still prohibiting the use of yellow oleo.

Mr. ANDRESEN. I think those are Minnesota and Wisconsin.

Mr. BARTLETT. What happened to Iowa? Did they pass it?

Mr. ANDRESEN. I think they did.

Mr. BARTLETT. They were fighting over it when I was there in April.

Mr. ANDRESEN. In Illinois you also allow the sale of frozen desserts that are made out of—I do not know what, but they are not made out of dairy products.

Mr. BARTLETT. That is right.

Mr. ANDRESEN. Is that having any effect on the sale of ice cream?

Mr. BARTLETT. It unquestionably does because people are buying frozen desserts. Per capita sales of ice cream have not gone down

much for the country, though reported sales include some sales of a frozen dessert with a vegetable fat. I think they are attacking that problem through State legislation. I have not seen the results of that. But the main problem there again as in evaporated milk, is: Is this frozen dessert masquerading as a dairy product? Specifically, last year I bought a pint of strawberry ice cream. The ice cream itself cost 29 cents, and what was this so-called dairy dessert cost 19 cents. It made me mad. The dairy dessert was a filled product. They have changed that since then to frozen dessert.

I think this law that has just been probably passed—I would have to check on that, I know one was proposed—made it clear cut whether the product was a dairy product or not a dairy product. I think that that is absolutely essential from the viewpoint of the dairy industry. On the other hand, personally I am not in sympathy with any legislation which will try to prohibit the sale of any honest food product as long as it does not try to ride on the good name of the dairy industry.

Mr. ANDRESEN. For 25 years we had a fight over the color yellow. The argument is used that it was not so much over the color yellow but over the tax. The objective was to get the color yellow for oleo so that it would look like butter. That legislation was finally passed. That has had a tremendous impact on the dairy industry, particularly in the manufacturing areas. To me, of course, that was a very real fight. I thought it was justifiable for the dairy industry to stand by its own natural color.

Mr. BARTLETT. Of course, if you get down to fine points on that, Mr. Andresen, I wonder what the butter generally in the country would look like if no color were added.

Mr. ANDRESEN. Of course, that depends on the time of the year and the type of the feed.

Mr. BARTLETT. I am just raising that as a point I know at home, when we made butter, we added coloring. We used to make farm butter.

Mr. ANDRESEN. I just brought that up in connection with what you said. Just one other proposition that I would like to have your comment on. We now have a price support program on a national scale for dairy products. The Government has purchased, since last November, approximately 275 million pounds of butter at the support price and I do not have the exact Cheddar cheese figure but I imagine that is around 175 million pounds. They bought several hundred million pounds of powder.

Do you have any comment to make on the program or what should be done in lieu of the present program?

Mr. BARTLETT. Yes. I wrote this article, which came out in our February-March 1953 issue of Illinois Farm Economics: Is the 90-Percent Parity Price Desirable for Dairy Farmers? That is included on pages 1437 to 1442 of that issue (exhibit VIII). The essence of my reasoning is that a 90-percent parity price is not desirable for dairy farmers. If I were going to change that—and I would have done exactly what Mr. Benson did with the current year—I would have included this 90-percent parity. On the other hand, I would reduce this just as soon as I could to 75-percent parity.

Mr. ANDRESEN. When you consider that wheat, cotton, tobacco, peanuts, are all under a fixed 90-percent support, would you not feel

that the biggest industry in American agriculture should have the same consideration?

Mr. BARTLETT. I think that that is something from a political viewpoint that should be considered, certainly. On the other hand, if I were a dairyman, I would be more interested in the dairy industry than I would be in all these other things. If I were losing my market for butter, I would say "Let's hold the market for butter and get the other things corrected if we can." From the viewpoint of good sense the sooner we get a 75-percent parity for butter the better the dairy farmers will be, regardless of all these other things. You fellows all get a higher salary than I do, and I think probably you earn it. You probably have higher expenses than I do. Just because I get a lower salary than you, I do not think that that is any reason why I should say that they have to boost my salary up to your level. I think it is more important for me to maintain my present salary rather than being fired and having to go to get one at a lower level.

Mr. LOVRE. Why do you think that 75 percent of parity is the answer to the surplus problem that we now have in butter?

Mr. BARTLETT. That would be my No. 1 step.

Mr. LOVRE. Why would that be the answer?

Mr. BARTLETT. Of course, the question gets down basically to people who will use more butter at 75 percent parity than they will at 90 percent parity.

Mr. LOVRE. I do not follow your reasoning on that when you can buy 2 or 3 pounds of oleo for 1 pound of butter. If you are going to take it down only 15 percent, I do not think that will make one iota of difference as far as the consuming public is concerned.

Mr. BARTLETT. I do not agree with you on that. I think what we have is a hard core of butter consumers. Getting back to my analogy of home-delivered milk, we have 30 percent of the people in Chicago who want home-delivered service even though the price is high. We also have a hard core of butter consumers. In my estimate for 1960 I estimated that butter consumption will be about 6 pounds per person in 1960. I think it is going down. The point that I am thinking of is in every product, the reason most people purchase products at chain stores is not because they love chain stores. The reason that consumers go to chain stores is because they can get the products cheaper. Basically you are going to sell more butter at 57 or 59 cents a pound than you will for 13 cents a pound higher. If that is not enough to free the market—basically I am not against a floor for farm prices—I think the floor should be at a level which year in and year out would clear the market.

Any floor that dams up the supply year in and year out for any farm product is too high and against the best interests of farmers themselves. One of the purposes, as I see it, of a floor on farm prices is to prevent manipulation which will push the price clear down to the farmer, someone else buys it, later the price rises, with somebody else coming out on top, and with the farmer left holding the bag. Basically the price of butter, a lower price for butter will sell more butter to a group of people who will pay more for butter, but not as much as the present difference in price. The question of butter competing with oleo, in my opinion, on an equal-price basis, is out of the question.

Dr. O. E. Baker some 20 years ago made this comment: he said the average person consumes 1,300,000 calories a year. It takes 11 acres to produce those calories in beef; it takes about 4 acres in dairy; it takes about three-fourths of an acre in soybeans or corn. Probably those figures have changed a little. But basically the fact is that it is cheaper to produce oleo, a vegetable product, than to produce an animal product such as butter. On the other hand, it does not make sense for either farmers or labor to price themselves out of a market. These 1,200 drivers who lost jobs in Chicago between 1930 and 1940, lost jobs because the margins were too high and people went to stores because they could get the milk cheaper. It does not make sense to me for the dairy farmers to price themselves out of the butter market. This is particularly true with colored oleo, publicity, and all the other things. Let us say we are agreed in maintaining a high level of income for dairy farmers, that we are all interested in that. In my opinion we are going to maintain a higher level of income to dairy farmers in the next 5 or 10 years with a lower butter price than with an attempt to maintain a 90-percent parity price.

Mr. WILLIAMS. Instead of a higher level why do you not say the cost of production to the farmers?

Mr. BARTLETT. That is another question.

Mr. WILLIAMS. Rather than use a high level price to farmers, I would have you say cost of production to the farmers.

Mr. BARTLETT. I would like to raise a question. Whose cost of production? The efficient or inefficient farmer?

Mr. WILLIAMS. The efficient farmer.

Mr. BARTLETT. I will go along with you on that.

Mr. LOVRE. Dr. Bartlett, so long as the farm problem is a price problem, I fail to understand why a 15-percent reduction in parity, from 90 down to 75 percent, would have any effect whatsoever as far as consumption of butter is concerned for the very reason that it is a price problem. If you can still buy 2 pounds of oleo for what you would pay for 1 pound of butter at 75 percent of parity, I think the consumer perhaps would still buy the oleo. I fail to see why you say 75 percent of parity. If you are opposed to 90 percent of parity, for the reasons that you have given, then it seems to me that by the same token you would also be opposed to 75 percent of parity because after all it is a price problem.

Mr. BARTLETT. My answer to that question is this, sir: I would go from 90 to 75 and then see what happened. If that was not enough I would go down to 50. The thing that I am interested in is the long-time view of the dairy industry. What you have today is a certain group of people who think butter is better than oleo. What you are doing by holding the price at such a high level is to alienate a marginal group of consumers and in this way are practically forcing them into the oleo camp. I would like to maintain as big a core of butter consumers as I can. I would let the competitive price answer that question. And along with it I would make every effort that I could to merchandize the product to get its good qualities called before consumers. Good merchandising goes along with it. But with a certain group of consumers today, many would rather buy butter than oleo. If you keep butter at a 90-percent parity for the next few years, instead of 6 pounds per person in 1960 I would predict it will be much less than that.

In other words, this hard core of butter consumers can be reduced still further. Let us take some analogies to one or two of these points. Why was the per capita consumption of milk in Chicago increased from 1945 to 1950 when per capita sales in the United States went down? Basically because we have had tremendous competition and the price and handling margin went down from what they used to be. The grapevine, people, knew that the price was low. The question of price problems, if you want to take this in regard to all of agriculture, the question Congressman Andresen raised, in wheat, in my opinion it is crazy to maintain the price of wheat at the present level. I think the price of wheat is entirely too high for the long-run benefit of the wheat producers. There is a problem of adjusting from a high level down to a lower level. But agriculture is not going to benefit as a whole by maintaining bottoms which will not clear the market year after year.

Mr. LOVRE. Then how can agriculture stay in business when the price keeps on going down and still the things that they have to buy keep on staying up? You know that the net income as far as the farmers are concerned is about at the lowest ebb now that it has been for years.

Mr. BARTLETT. Here is my answer. One hundred and fifty years ago 90 percent of the people were farmers. Now it is roughly 15 percent. Maybe we should encourage a few more farmers to get the high wages of urban industry. Farmers are free to shift into something else. If we have too many farmers to produce these products they will shift. If year in and year out the farmers' sons can make more money working for somebody else, they are not going to farm. Certainly I would not try to maintain the level of farm income by trying to pull myself up by my bootstraps.

Mr. LOVRE. How long can this condition continue? As long as you have at least a partially planned economy, as long as you have a bottom or a floor for wages and hours, it seems to me by the same token you also have to have a floor for agricultural products.

Mr. BARTLETT. I agree with you in regard to the floor. I think maybe the point that we might not agree on is the height of the floor. I would have the height of the agricultural floor at a point that over a period of years will clear the market.

Mr. LOVRE. Isn't parity nothing more than a price that is considered fair to the producer and consumer alike?

Mr. BARTLETT. No; 90-percent-parity butter is a price that is too high to clear the market. Consumers have reduced their butter purchases.

Mr. LOVRE. In Wayne Darrow's Newsletter last week, it was stated in substance that when farmers receive in the neighborhood of full parity, everybody was prosperous. When the farmer received in the neighborhood of 80 to 90 percent, agriculture was in a pinch. And when the farmer received less than 80 percent of parity he was in a depression. Do you agree with that?

Mr. BARTLETT. Is Wayne Darrow an economist? I would have to check a little. I would say that the farmers between 1942 and 1950 had one of the highest incomes ever realized by farmers in the United States; but that period is past and we have to adjust ourselves down to a little lower level. In 1952, we had $1.53 in purchasing power of

consumers for each dollar that we had prewar. This is a good period right now to get farm production adjusted, in line with consumer income.

Mr. LOVRE. At the expense of a few farmers, yes.

Mr. BARTLETT. Let us follow that through. Suppose we try to maintain Atlas on our shoulders. We try to maintain wheat prices at a level too high. Butter prices at a level too high. Cotton prices at a level too high. All we are doing is to encourage substitution of some other things—rayons, nylons, in place of cotton; oleo in place of butter, and so forth.

Mr. LOVRE. In spite of that fact, is it not true that the farmer's share of the consumer dollar today is less than it has been for many, many years?

Mr. BARTLETT. Right now it is; but doing the period of 1945 to 1950 it was one of the highest historically that we ever had.

Mr. LOVRE. I am talking about now, not years ago.

Mr. BARTLETT. The point that I am making, sir, is that we were at an abnormal level historically, and we have to adjust ourselves to more of what I call the norm in relation to other income. Let us take one point further. I am not trying to prolong this discussion, but suppose the bottom dropped out of consumer prices tomorrow. The farmers would be in a devil of a fix then. To me it is much more sensible to repair your roof when you have sunshine. And we have sunshine from the viewpoint of domestic income today. Farm production can be adjusted. It does not mean that many farmers are going out of business if we put butter prices at 75 percent of parity. It does not mean that the dairy farmer is going out of business. The dairy income has to be at a level in relation to beef and hogs and corn and others, or they will go out of the dairy business. There is an equilibrium there. It is much better, in my opinion, to get this adjustment during a period when the sky is clear, domestically, with a high level of consumer income, than it is to try to wait until we might have a recession.

Mr. LOVRE. It is all right to have the readjustment, but you cannot have it all at one end of the string. You have to have it also on industry and wages and all the other elements that go in to make up price. You cannot have it all on the farmers.

Mr. BARTLETT. Let us get down personally again. When you are thinking about the affairs of your family, do you say that just because Jim Jones has a higher salary than you, do you maintain that you are going out of business if you do not get his salary? Basically, just from the selfish viewpoint of farmers, let us just forget the rest of the people, I raise this question: Is a 90-percent parity price desirable for dairy farmers? I did not raise it in connection with consumers. I just raised it in connection with dairy farmers. I think it is very bad for dairy farmers to have a 90-percent parity. I think the sooner we get down to a 75-percent parity the sooner you will have the support of your butter farmers. Butter farmers are clear ahead of some of the others. Butter farmers, many of them, want lower prices and want to sell their products commercially. They do not want the Government buying their products.

Mr. ANDRESEN. I think my friend from South Dakota has in mind that the farmers are always the first ones to take a licking, and if we could have an adjustment throughout our entire economy at the same time, then it would not make any difference.

Mr. LOVRE. That is right.

Mr. BARTLETT. Of course utopia is desirable, too. But it is a long way off.

Mr. LOVRE. Ninety percent is not utopia. That is only 90 percent of what is fair.

Mr. BARTLETT. I think in South Dakota, and I worked with your dairy-marketing specialists, that you will find that a lot of farmers would rather have 75 percent parity prices today and sell the butter to consumers than to have a big segment of it going to the Government.

Mr. WILLIAMS. Dr. Bartlett, the only problem that you have, or the only people that you dislike in this dairy situation are the New York people. Is that right?

Mr. BARTLETT. I like the New York people. I would say that I used New York as an example because New York is one of many that are in the same boat. And we have facts on it.

Mr. ANDRESEN. Dr. Bartlett, we want to thank you for the contribution that you have made to our committee, which is very valuable and helpful.

Mr. BARTLETT. I appreciate the opportunity, Mr. Chairman.

I will turn over all my material.

Mr. ANDRESEN. If you want to go over your remarks that you have made to the committee and insert such statements as you wish, such additions to clarify your viewpoints, you may do so.

The committee will stand adjourned.

(Whereupon, at 12:11 p. m., the subcommittee adjourned.)

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